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Christmas  
Wish List

Radio Control

47380

December 1992

# CAR ACTION

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INNOVATIVE  
CARS

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RACE ACTION

**IFMAR**  
1/12-Scale  
Worlds

**ROAR**  
On-Road  
Nats

**SNEAK  
PEEK!**  
Futaba's  
Newest  
Radio

**TRACK TESTS**

**SCHUMACHER  
BOSSCAT**

**WCM  
GRAND  
NATIONAL**  
**TEAM COBRA  
LTOOR**

**TRIM  
LEXAN  
THE  
EASY  
WAY**

**REBUILD A  
STEALTH  
TRANNNY**



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**ON THE COVER:** our main photo shows Schumacher's BossCat. (Photography by John Huber.) From top to bottom: JR-Propo R-756 radio; Tomy TXR-002 Robot; HPI 10L Project Car. (Photography by Walter Sidas.)

SPEEDWORKS



# EDITORIAL

## EAT THIS!

WELL, IT'S THAT time of year again. What did you wish for this Christmas, boys and girls? Clean oceans? World peace? A new speed controller? I'm hoping to find one of those new Mazda RX-7s (the R1 version please, Santa) under the *Car Action* tree this year. I've been good, I've been *really* good; I even attended one of the worst races in recorded history—the '92 ROAR Off-Road Nats—and lived to tell about it.

I'm not usually a complainer, but I feel very bad about this race—not for ROAR or the promoters of the event, but for the racers who spent their hard-earned money hoping to see what it's like to participate in the premier off-road race in the country. (Sorry guys; better luck next year.) I'm also sympathetic toward those who won; their victories seemed to pale in comparison to the overwhelming feelings of disgust that prevailed. What should have been a well-run, enjoyable event, turned out to be a disaster of extraordinary magnitude.



Attending a national event should be a "once-in-a-lifetime" experience (for many racers, it really is)—a chance to meet and talk to (and compete against) the big-name racers you've read about. It should be an R/C extravaganza, not merely a race.

Everyone deserves more than just 20 minutes of running time; they deserve a tried-and-true computer system that has a fail-safe back-up system; and they deserve good lighting over *all* the track.

They *don't* deserve to be charged for practice time or to be denied adequate pit space. Those who weren't fortunate enough to grab one of the indoor pit spaces had to pit outside the building under a tent. This was OK, but there were no lights until Saturday night, and then they were completely inadequate. Racers who pitted indoors didn't fare much better; to make the area useable, they had to sweep out loads of dirt.

Although it's really not that hard to determine who's to blame for "The Texas Chain-Saw Massacre," pointing the finger isn't really important. What's crucial is that measures be taken to prevent other events of this caliber from suffering the same fate. We enjoy R/C racing and shouldn't have our enthusiasm ruined by events that are poorly planned and badly executed. Races are for the competitors, not the sanctioning bodies or the track owners. Whaddyathink?

*Frank Masi*

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# LETTERS

## MORE MASAMI

Do any back issues of *Car Action* contain articles on Masami Hirotsuka? Do any have color photos of his Stealth RC10? Thank you for your time.

SAM KWAN  
Monterey Park, CA

*Sam, Car Action featured Masami's '89 World Champion Yokomo in the November '90 issue. In August '91, we ran an article on Masami's 2WD and 4WD—the cars that won the Reedy Race of Champions. And in April '92, we unveiled Masami's '89 World Champion Stealth Car. That issue also includes an exclusive interview with Masami.*

AS

## BUDGET RACER

A friend of mine introduced me to R/C racing, and I really enjoyed it, but I didn't have enough money to buy my own vehicle. Now I have a job, and I can afford an entry-level car kit (around \$100). I was thinking about a Traxxas Hawk 2 because it seems to have many good features. What's your opinion of it?

JOSEPH JONES  
San Gabriel, CA

*We've just completed preliminary testing of the Hawk 2 and I'm happy to report that it's even better than its predecessor in almost every way—performance, durability, etc. We'll have a full review of it in an upcoming issue. You might also want to check out the latest R/C Monster and Racing Trucks issue; it contains reviews of four low-budget race trucks. Good luck with your choice and your racing career.*

JH

## NO BULL

I own a close-to-new Clod Buster. Although I'm a beginner, I'm learning quickly. I've read a lot about the Tamiya Bullhead truck, and I'm interested in getting the body for my Clod. None of the hobby shops I've called sell it. Do you know where I can get one?

CHRIS HARRISON  
Chandler, AZ

*Tamiya products have been hard to find in the past few months because Tamiya Inc. has been busy setting up a new branch—Tamiya America. That company is up and running, so your local shop should now be able to get any Tamiya parts you need. If they still can't help you, contact Tamiya America directly at 101 Columbia, Aliso Viejo, CA 92656.*

AS

## RADIORAMA

I can buy a mint Airtronics XL2P from a friend for \$50. I understand that JR's Alpina PCM radio has a fail-safe system that would prevent my Kyosho Outlaw Rampage from going berserk in the event of signal loss. Do you think it's worth spending an additional \$80 to get the PCM instead of the XL2P? Is the fail-safe that effective?

I'm getting into gas cars, and I need a receiver battery pack. I'm thinking of buying a built one, but how do I recharge it? Do I need a special charger?

KAEO MILKER  
Anaheim Hills, CA

*Both radios are very good; I say, save some money and go for your friend's Airtronics XL2P. The fail-safe system is desirable for the reason you mentioned, but whether it's worth an extra \$80 is up to you. For your receiver pack, you'll need an adjustable linear charger that can charge as low as 0.5 amp. Charge AA batteries and mini-cells at 1 amp until they peak. Novak and Tekin make high-quality chargers of this kind.*

JH

## THE RIGHT DIRECTION

I was looking back at the "New for '92" column in the February '92 issue and noticed the Blackfoot hop-ups. I wanted to modify mine, so I started to look for things like the scale depth box and all the other parts. To my surprise, I couldn't find Advanced Engineering, let alone the parts. Can you help me find them?

JED TRIMBLE  
Lawrenceville, GA



You can contact Advanced Engineering at P.O. Box 766, 180 S. Highway 67, Unit G, Woodland Park, CO 80866; (719) 687-2626.

JH

#### SERVO SEARCH

I've wanted a KO Propo PS 1001 servo for quite some time. Now that I have enough money to get one, they don't import them anymore. Do you know where I can buy one? Also, what's a good gear ratio for my Kyosho Lazer ZXR with a Speed Metal 12 triple? Thanks for all your help.

MIKE SHAMLOO  
Beaconsfield, Quebec

*It's true: KO Propo radio equipment is no longer being imported by Global Hobbies. As far as I know, no one else has picked up the line, but I'm sure someone will soon. In the meantime, you might want to look into the Airtronics 94151 servo. It has a transit time of 0.08 second and 76 ounce-inches of torque—very similar to the speed and strength of the 1001. About that gear ratio: try 10 to 1 on six cells. You can adjust up or down to suit the track and your batteries.*

AS

#### CONVERT, OR NOT?

I received an aluminum RC10 basic kit for Christmas three years ago. Since then, I've added bearings, a Team Losi Super Insane motor and a Novak T4 speed controller. I use a Futaba Magnum Sport radio, and I race my RC10T in the stock class on a carpet track. I was wondering if it would be better (or cheaper) to buy a new RC10 Team Car or convert mine into one (Stealth tranny, chassis, etc.).

You have a great magazine! One suggestion though: why not add diagrams of the tracks to your race coverage?

JASON MORRIS  
Peoria, IL

(Continued on page 68)

# New In '92

## RC-10 and RC-10T

2003 RC-10 Telescoping Drive System w/H-Arm for Stealth **64.95**

2005 RC-10T Telescoping Drive System w/H-Arm for Stealth **64.95**

2001 RC-10 Telescoping Drive System

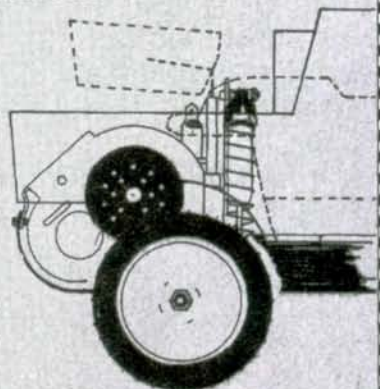
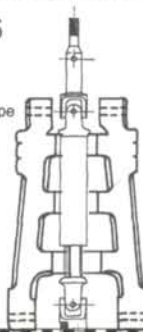
w/H-Arm for MIP & J Car **64.95**

2002 RC-10 Telescoping Drive System

w/H-Arm for Trackmaster w/H-Arm **64.95**

2005

Prototype  
H-Arm



ALL PARTS Available  
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## CUSTOM WORKS & TITAN

2080 C/W & Titan Hard Anodized Shock Bodies (4) **24.95**

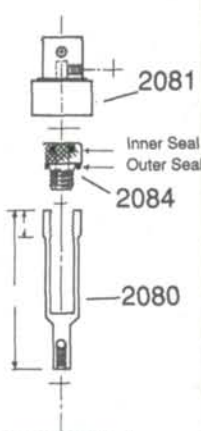
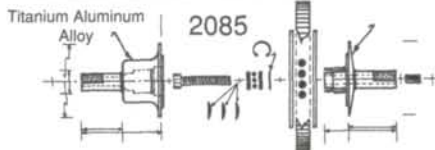
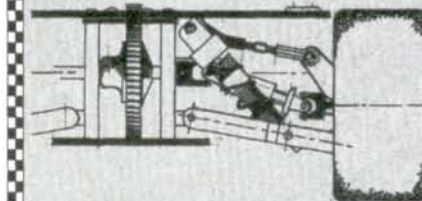
2081 C/W & Titan Aluminum Spring Retainer (1) **6.00**

2084 C/W & Titan Aluminum 'Double O' Rings (1) **5.95**



2083 C/W Intimidator Telescoping  
Drive System **54.95**

2085 C/W Intimidator Lite Weight  
ProBall Diff. **44.95**



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Special Thanks for Rod Ward, Mike Bell and Team  
Riverside for support and R&D.



# TROUBLESHOOTING

by FRANK MASI

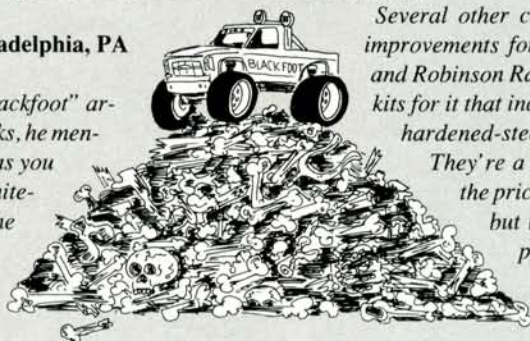
If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.

## SWING (SHAFT) SHIFT

When I assembled my new Tamiya Blackfoot, I stripped the rear dogbones. I read about CRP's graphite dogbones in your '92 *Monster and Racing Trucks* issue, but no one I've called has them. I'm thinking about getting Kyosho universal swing shafts. Will they work in the Blackfoot? Which are better, the dogbones or the swing shafts? Thanks for all the info in the magazine.

Dan Bechtel, Philadelphia, PA

In John Huber's "Home-Built Blackfoot" article in *Monster and Racing Trucks*, he mentioned CRP graphite dogbones, as you noted. Specifically, they're graphite-reinforced nylon dogbones for the Tamiya Blackfoot (part no. 1605). CRP still produces them, but they're currently out of stock.



Unless you have access to a machine shop, it would be impossible to adapt Kyosho swing shafts to the Blackfoot; they're much longer than Blackfoot axles, and they won't mate to the Blackfoot's diff outdrives. Also, the Kyosho shaft's axle sections won't allow you to use the Blackfoot wheel hubs.

Several other companies also make drive-line improvements for this venerable vehicle. Thorp and Robinson Racing produce complete ball-diff kits for it that include telescopic drive shafts and hardened-steel diff components and axles.

They're a little expensive (compared with the price of replacing worn stock parts), but they offer vast improvements in performance and durability.

## IGNITION INQUIRY

I'm really interested in buying a .12-size gas-powered car, and I have a few questions to ask. Are the Kyosho Rampage and Outlaw Rampage cars good? Are O.S. CZ-R .12 engines good? Are they hard to break-in? Besides a radio and fuel, what else do I need to get the car going? Is a Futaba S148 servo powerful enough for a truck? If not, do I need a bigger servo? I'm having trouble finding the TD Enterprises Pit-Box II that you featured in the April '92 issue. Can you help me? Thanks a lot and keep up the good work.

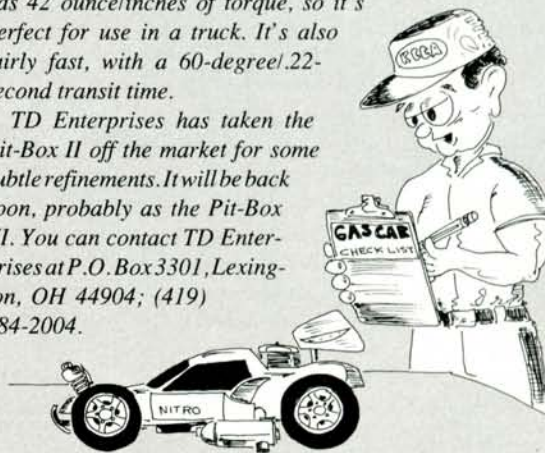
Kevin Hogue, Novato, CA

We think that gas-powered R/C is loads of fun, and Kyosho's Rampage and Outlaw Rampage are good vehicles with which to get started. The O.S. CZ-R engines are among the best you can buy, and they're no harder to break-in than any other gas engine. The carburetor setting is the most important aspect of engine break-in. Run the engine rich (more fuel) for the first four or five tankloads of fuel. This protects the engine from being damaged by excessive heat, and the extra fuel (which contains lubricant) helps all the engine's moving parts to wear-in properly. If you run the engine too rich, however, it won't reach a proper operating temperature.

Most 1/10-scale gas cars come with pull-start mechanisms. If you buy one that doesn't, you'll need a 12V, electric, hand-held starter. You'll also need a glow-plug igniter and a battery pack to power the car's radio system—usually just four AA cells.

I recommend that you use a servo with at least 40 ounce/inches of torque in a truck. The Futaba S148 has 42 ounce/inches of torque, so it's perfect for use in a truck. It's also fairly fast, with a 60-degree/22-second transit time.

TD Enterprises has taken the Pit-Box II off the market for some subtle refinements. It will be back soon, probably as the Pit-Box III. You can contact TD Enterprises at P.O. Box 3301, Lexington, OH 44904; (419) 884-2004.



ILLUSTRATIONS BY GERRY YARRISH



## CURRENT (LIMITING) EVENTS

I have a JRX-Pro SE and a Novak 410-M1c speed controller. As you know, Novak has a current (torque) limiter, and the Pro SE has a slipper clutch. Many people I know are confused about which to use. I assume that both shouldn't be used at the same time. Which should I use? How do I use one and not the other? I'm thinking of adding the Hydra Drive. Would this change your recommendation on how to adjust them? From what I can tell, this is confusing to many racers, and your help would be appreciated.

**Richard Hirschman, Kent, OH**

*Basically, the type of track dictates whether you should adjust the friction slipper or the current limiter. If you run on a very slippery track, set your current limiter to about 40 to 50 amps. Novak's unit is set at the factory to 60 amps. You should use the current limiter to control wheel spin on slick tracks (and not just rely on the friction slipper) because the slipper will eventually engage fully, regardless of how loosely you've set it, and the rear tires will break loose. Besides, it's much more efficient to limit the power coming from the battery than to waste it spinning the friction slipper or the rear tires.*

*On tracks with more bite, set the current limiter at 60 amps or more, and adjust traction with the friction slipper alone. Generally, use the current limiter on tracks that cause the rear tires to spin even when the slipper is set loosely.*

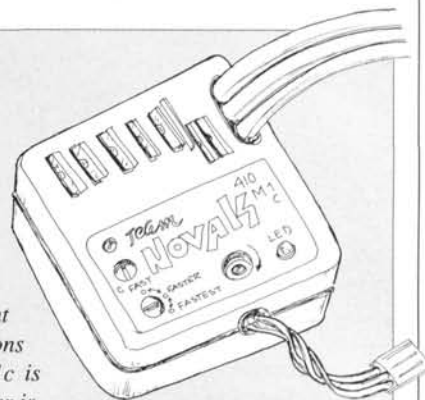
*When track conditions provide enough traction to allow you to set the friction slipper tightly, crank up the current limiter.*

*Setting the current limiter on newer versions of the Novak 410-M1c is easy; the potentiometer is metered, and it has a small pointer on its dial. Simply turn the dial to the desired amp setting.*

*Older M1cs have standard pots that you must adjust with a tiny screwdriver. You'll need a voltmeter to set an older model accurately. A current-limiter setting of 60 amps would read 0.030 volt, or 30 millivolts on a digital voltmeter; 40 amps would be 0.020 volt; 80 amps would be 0.040 volt, etc. For 2WD modified, the current limiter should be set between 40 and 60 amps; 2WD stock may require a higher amp setting.*

*If you don't have access to a digital voltmeter, the only way to set the current limiter on an older 410-M1c is by "feel"; put the car on the track and do a series of full-power takeoffs. Adjust the current limiter so wheel spin is minimal.*

*I've used the Losi Hydra Drive on my SE for a while, and I find that a current-limiter setting of 60 to 80 amps is ideal.*



## IN A BIND!

Whenever I compress the left rear shock of my RC10T, it seems to stick. I've disassembled the shock twice after reading the manual carefully, but nothing helps. Should I clean out the shock? I use the 30WT oil that came with the kit.

**John Pavalko, Lakewood, CO**

*First, check the shock for binding. Many people make the mistake of over-tightening the upper nut that secures the top of the shock to the shock tower. Tightening the nut too far can compress the nylon pivot bushing, which will flare and inhibit the movement of the shock. It's also possible that you've over-tightened the lower 4-40 screw that secures the bottom of the shock to the A-arm.*

*If you've determined that the shock is mounted correctly, check the shock itself. To do so, drain all the oil from the shock, then move the shock shaft in and out of the shock body. It should feel very smooth and move easily. If it doesn't, find out if the piston is causing the binding, or if the seal itself is binding the shaft.*

*Remove the ball-pivot from the shock shaft, and slide the shaft and*

*piston assembly out of the shock body completely. From the outside, insert the shock shaft through the seal. It should feel smooth and move freely. If it doesn't, wiggle the shaft around to align the seal washers and spacers. If this still doesn't fix the problem, remove the seals and replace them with new ones.*

*If you've determined that the seals aren't causing the shock to bind, insert the piston (while it's attached to the shock shaft) into the shock body. The piston should fit snugly with very little play; a piston that fits too tightly, however, must be sanded lightly to decrease its diameter.*

*The only other possible cause of binding would be a bent shock shaft. To check this, remove the shaft from the shock, and take the piston and E-clips off. Roll the shaft on a piece of smooth glass; it should roll freely. If it doesn't, the shaft is bent and should be replaced.*

*Thirty-weight shock oil works well in the RC10T, but make sure that you use 100-percent-silicone oil, e.g., Associated's. It isn't affected by temperature changes, so damping is consistent, regardless of the weather.*





## TWO TIGHT!

I have a Team Losi Junior Two. None of my battery packs will fit, and I don't know why. They don't slide in all the way. Can you help me?

Jeremy Sebestyen, Juneau, AK

*Fear not, Jeremy, I had a similar problem, and here's how I solved it. I'm assuming that you use stick-type batteries with molded endcaps, and that your battery packs are just too long to fit inside the molded chassis where they should. The easiest "fix" is to simply remove the plastic endcaps from your battery pack. This may seem drastic, but it's the only way to make a stick pack fit without rebuilding it to a side-by-side formation.*

*The endcaps are placed on the battery pack before the outer layer of shrink-wrap, which holds them on, is applied. Carefully cut the shrink-wrap with an X-Acto knife where it meets the endcaps (be careful not to cut into the cell's shrink-wrap). The rear cap will slide off easily, but you may have to cut the front cap in two with scissors to slide it past the connector.*

*You could also remove the outer layer of shrink-wrap entirely, remove the caps, then apply new shrink-wrap over the cells to keep them in place.*



## NITRO NOVICE

I have a few questions about gas cars. I'm thinking of buying a Kyosho Assault from a friend. If I buy it, I plan to do a little work to improve the suspension, like Dave Hudson did to his High-Octane RC10 in the June '90 issue. I have an Ultima II and a Lunch Box. I don't have much experience with gas cars, but I did help my friend build this Assault and a Kyosho Nitro Brute. I want to buy an engine that has a recoil starter, and I know that the O.S. CZ-R .12 has a recoil in the Outlaw Rampage. Does it come with one when you buy it separately? Can I order just the recoil system? Will it fit the stock .12 engine that comes with the Assault? Would an O.S. .21 SE-R be too much power for this car? I love the mag.

David Greer, Elkton, MD

*If you're looking for a .12 engine, the O.S. CZ-R is about the best one you can get. The pull-start system must be ordered separately if you plan to buy just the engine. Here's what you'll need: from Tower Hobbies, an O.S. crankshaft that's designed to work with the pull start (part no. 21202000, \$14.95); from Kyosho, a special one-way bearing (part no. FD-24, \$9.95); a special backplate (part no. FD-22, \$4.50); and, of course, the pull-start mechanism (part no. FD-23, \$10.95).*

*The engine that comes with the Assault is an O.S. CZ-2. This engine has a zip-cord starter that uses the same crankshaft as the one you'd need to convert the CZ-R to a pull-start.*

*If it's performance you're after, buy a hand-held, 12V starter with a wheel attachment. This eliminates the extra rotating mass that a pull-starter can add; simply bump the starter wheel against the engine's flywheel. Many authorities claim that their cars' performance has improved drastically since they've removed the pull-starters.*

*Forget the .21-size engine. If you've ever seen one of these beasts power an 1/8-scale car, you know that installing one in a 1/10-scale car wouldn't work well; it produces too much power for even the 1/8-scale cars. A smaller car would probably explode!*



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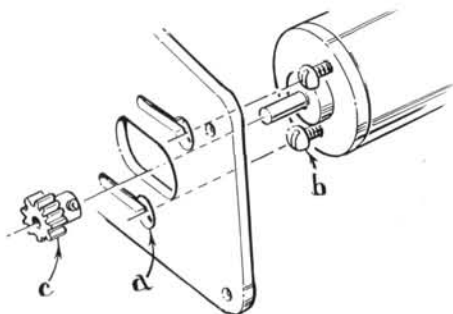
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# PIT TIPS

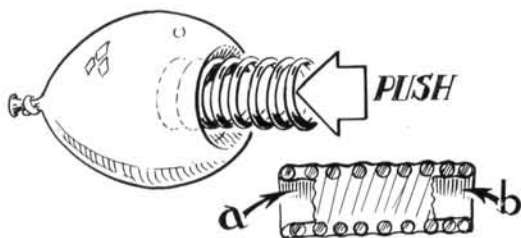
by JIM NEWMAN



## EASY-OUT MOTOR

Drill out the motor-plate holes (a) to clear the heads of the screws (b), then file slots that extend from the holes as shown. Just loosen the screws and remove the pinion (c) to remove the motor quickly.

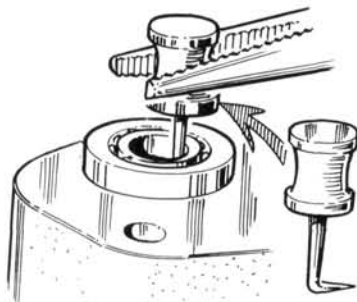
*Lee Spano, Bedminster, NJ*



## SHOCK SPRING GAITERS

To keep springs clean and protect shocks, inflate a balloon and pinch it closed between your fingers. Press the springs into the balloon, let the air out and trim away the excess material to leave the springs completely enclosed.

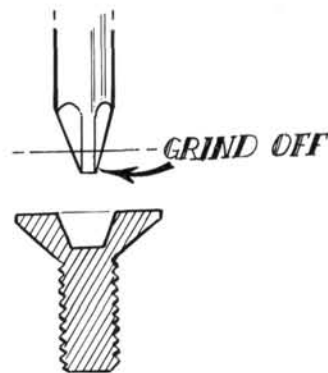
*Adam Tomlinson, Arvada, CO*



## BEARING PULLER

Bend the point of a push pin, hook it under the bearing, then carefully tease the bearing out of its recess using a pair of long-nosed pliers (as shown).

*Rock Woodstock, Rock Island, IL*



## PHILLIPS-HEAD SCREWDRIVER FITTING

If your screwdriver won't enter a slot all the way, grind a little off the end of the bit. This allows the screwdriver to engage the slot more firmly.

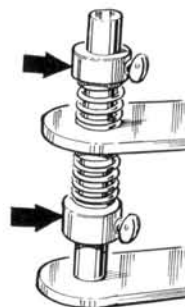
*Fred Ching, Monterey Park, CA*



## TIE-ROD CLAMPING

Instead of replacing the complete bent tie rod, make a split tie rod of two pieces of  $\frac{1}{16}$ -inch music wire. Clamp them together with a  $\frac{1}{8}$  inch metal collar (see arrow), such as that made by Goldberg (it's steel and the screws can really be torqued without stripping out).

*Albert Chan, San Francisco, CA*



## STRONGER COLLARS

On the RC10L, replace the plastic collars on the pod damper posts with  $\frac{3}{16}$  inch metal collars from model planes.

*Wilbur Howell, Levittown, PA*

**PLEASE NOTE:** Be sure to print your name and full address clearly on every letter and sketch you send to Pit Tips. We have to throw away many good tips because we don't have the sender's name or address.

(More Pit Tips on page 43)





# INSIDE SCOOP

by CHRIS CHIANELLI



IN SEARCH OF GLORY AND THE GOODIES THAT WILL HELP YOU GET IT!

## BLACKFOOT The next generation



**Q.:** What started the monster truck phenomenon?

**A.:** Tamiya's Blackfoot.

Although the Blackfoot is the best-selling 1/10-scale monster truck ever—and deservedly so!—it isn't perfect. Now, Tamiya has kept many of its best features, e.g., its beautiful scale appearance, and redesigned and improved what's under that Ford 150 skin to create the new Super Blackfoot.

The Super Blackfoot has a cast-aluminum bevel-gear differential and dogbones (both are vastly more durable than the old equipment). Upper and lower wishbone suspensions replace the old "I-arm" front end and trailing-arm rear suspension and provide greater travel and a wider stance. As always, we'll give you a full-blown report on this new Tamiya offering before anyone else! Until then, remember: the Super Foot lives!

## Mugen '92

The latest Mugens are here and they're stocked with world champion-level technology. Mugens have



won many important races in the past (including the 1990 1/8-Scale World Championship in Bangkok, Thailand); in

July, they took the TQ honors at the 1992 1/8-Scale World Championships in Germany. Both the improved Super Sport '92 Buggy and the all-new Super Sport '92

Truck have the knowledge gained from this extensive race experience incorporated in their design. Both cars feature full ball bearings, new shock designs, light spoked wheels, steel spur gears and conical gears, disk brakes and much more. Since I like to relax, obviously I like the Truck. It comes 80-percent built! Mugen



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## Traxxas MAKES NOISE!

When it comes to racing trends, Traxxas doesn't lag behind. From the Dallas, TX, skunkworks comes the all-new Nitro Hawk. This contender for the 1/10-scale gas truck class features Traxxas's own Image .12 glow engine, which has a recoil starter, an oversized, finned heat-sink head and a



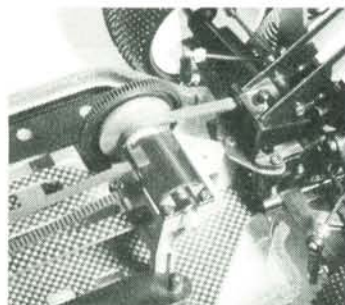
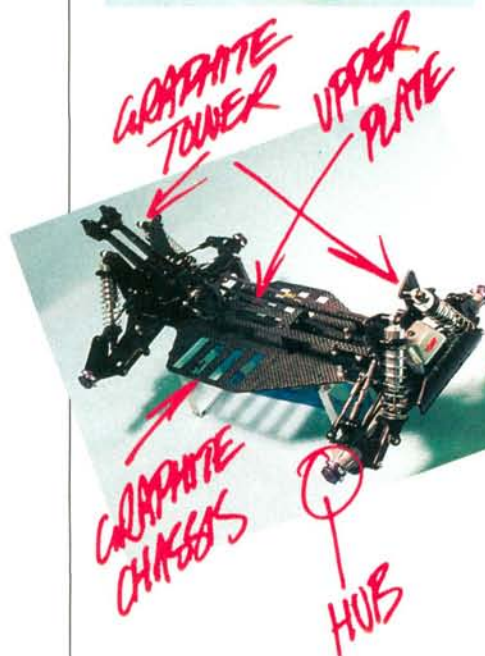
bronze-bushing-supported connecting-rod lower end. The truck has a new tranny with a slipper clutch, a T-6 aluminum chassis and shocks, plus the Blue Eagle LS suspension. Rumor has it that the Nitro Hawk is capable of 35 to 40mph! Available ready-to-run, with or without radio equipment.



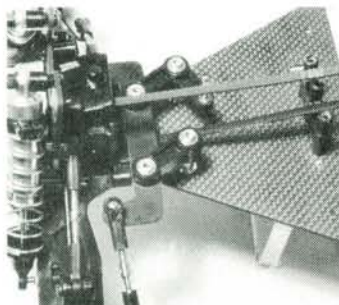
## the Intruder Option

The Tomy Intruder has been doing well in Japan, Hong Kong and the UK, and Tomy America Inc. is very serious about making it more competitive here in the States.

Toward this end, Tomy will soon offer many after-market parts for the kit. These will include a graphite chassis, an upper chassis plate, front and rear shock towers, a ball-bearing steering kit, light wheel hubs, a rear slipper clutch (with an Associated-type spur-gear) and one-way front bearings. I understand such items as 27-percent-longer arms and front caster options are in the works. For more information, contact Tomy America Inc., 1050 W. Central Ave., Brea, CA 92621; (714) 256-4990; fax (714) 256-4835.



Rear traction control



Ball-bearing steering kit



## KRIS MOORE WINS WORLD CHALLENGE

Team Kyosho's Kris Moore defeated more than 140 competitors to win the 1/8-Scale 4WD Class at the '92 Kyosho/Car Action Gas Off-



Road World Challenge. Held in August at Team SEMROCC's '91 Worlds track in Sterling Heights, MI, this was the largest-ever off-road gas race in the U.S. Kris took the win over his teammates Kazushige Yoshida (second-place finisher at the '92 IFMAR 1/8-Scale Off-Road Worlds), Yuuichi Kanai (all-Japan champion) and TQ Jack Johnson (who ran out of gas with just two minutes to go!).



## off & on with Yokomo

Here's a close-up photo of the latest products from that little company in Japan with the many big titles to its credit.

First, we have the new 1/10-scale F1 car that features a fully independent wishbone front suspension; its rear incorporates a direct belt-driven, centrally mounted ball diff and a fully independent wishbone suspension.

Next, there's Yokomo's Superdog Works '93. Yokomo, which makes some of the most popular and successful 4WD off-road cars in Europe and Japan, has introduced the latest version of its 4WD competitor. It incorporates many of the changes made to the team cars used at the '91 Off-Road Worlds. It has new shock towers for improved geometry, a fully adjustable slipper clutch, a redesigned chassis configuration for better weight distribution, special hub-carrier supports to elimi-



nate front-arm flexing and a colored, molded wing. If you're interested in either of these hot contenders, contact Yokomo's North American distributor: Competition Imports, 2691 Viscount Way, Unit 101, Richmond, British Columbia, Canada V6V 1M9; (604) 270-9060.



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## GET A MAGIC RIDE



You can have the same front suspension that Joel "Magic" Johnson used to steer his way to victory at the IFMAR World Championships. The new Trinity Evolution Independent Front Suspension can be bolted directly to any 1/10-scale Associated or Bolink car using most of the existing hardware. Its geometry is the same as Joel used on his Trinity Evolution 10 at the IFMAR Worlds. It features infinitely adjustable camber and caster, and the Evolution front end can be set to automatically decrease caster as the suspension is compressed to boost low-speed steering. It's available in superspeedway and standard versions. Contact Trinity Products, 1901 E. Linden Ave., #8, Linden, NJ 07036; (908) 862-1705.

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# READERS' RIDES

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## FUTURE COUGAR

Aaron Pulpaneck of San Ramon, CA, sent this photo of his totally tricked-out Schumacher Cougar 2. The car is equipped with a Novak 410 ESC, an



Airtronics 94737 servo, a Reedy Mr. A 14-turn triple motor, Lunsford titanium turnbuckles and a "Jeff Whitman Super Steering" system.

The awesome paint job was also supplied by Jeff Whitman. You can get a quick glimpse of Aaron's car as it tears up the track at the nearby Hobby Haven Raceway in Livermore, CA.

• • • • •

## OVERSEAS R/C

Ship engineer Franz Kohler lives in Holland and he travels. On one trip, near the coast of Saudi Arabia, Franz accidentally ran his Tamiya QD Horizon off the side of his boat. After that incident, Franz bought a Tamiya Astute and modified it extensively. Then Franz's girlfriend was bitten by the R/C bug, so he bought her a Tamiya Mud Blaster that he equipped with a Trinity "The Boss" stock motor and a Futaba ESC. To top it all off, Franz added a Cobra body that he airbrushed himself. Don't lose this one to the sea, Franz.



• • • • •



## ONE R/C BURGER, RARE, TO GO!

Fifteen-year-old Jay Thorton of Ontario, Canada, sent us this photo of his concours-winning Andy's Oldsmobile body on an RC10L SS—not bad, for only the second body he's ever airbrushed! The car is equipped with a Novak M5 ESC, an NER2x receiver and matched SCR 1700s and 1400s. A Futaba Magnum Junior helps to control it. Jay also races superspeedway with his modified JR-X2. Jay lives on a "beef farm," and to support his racing, he sells off a few calves now and then. That has our vote for the most unique way to finance your hobby.



# NITRO NEWS

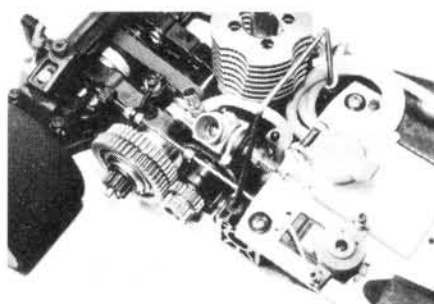
## MISSING LINK

by JEFF BRONSTEIN

**I**N THE LAST decade, the most important development in electric racing has undoubtedly been the invention of the electronic speed controller. This little wonder eliminated the need for an extra servo, spare linkage and the unsophisticated swing-arm speed-controller mechanism. Setting the solid-state speed controllers is much simpler than setting the older mechanical units with their additional linkage and hardware, and this may be partly responsible for the overwhelming growth of electric racing in the past five years.

Gas cars, on the other hand, still use linkage to control the engine throttle and the brakes. Although it seems fairly uncomplicated to install and adjust, the throttle linkage can greatly affect your car's performance. If it's set incorrectly, it can even cause serious damage to the engine and the throttle servo. Meticulous attention to the linkage, its timing and the distance it travels will improve your car's performance and enhance your driving ability.

When you build a new car, installing the throttle linkage is usually one of the final procedures. When the engine and servos are in place on the chassis, you can set up the linkage wire and connecting joints. Usually, the throttle linkage is connected in a "seesaw" manner to the carburetor on one arm of the servo, and to the brake on the other. In this position, both throttle and brake use the servo's pulling action to operate. There are some cases, however, when both the throttle and the brake must be attached to the same side of the servo arm. With this setup, the pushing motion of the servo opens the carburetor and the pulling action applies the brake. The con-



**The standard linkage arrangement is a "seesaw" layout, in which one side governs the throttle and the other the brake. If the linkage is set improperly, it can cause severe damage to the engine or servo.**

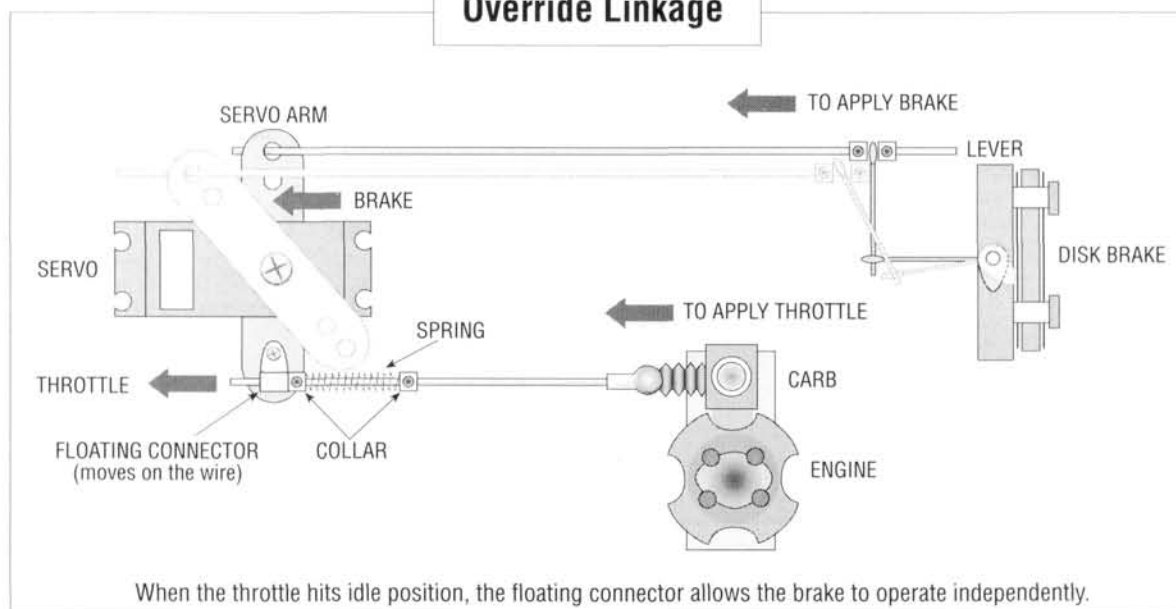
nections should have as little excess movement as possible.

Many 1/10-scale cars have factory-installed throttle and brake linkages. Although the wire and the connectors are in place, the manufacturer usually leaves some overlap in

the setup to accommodate radio equipment.

New gas kits include the linkage wire, springs and collars, and possibly even the servo arm for the linkage, but that's it. In general, a Z- or L-bend connection between the servo arm and the carburetor is good for recreational and limited racing, but for serious competition, the movement must be consistent and exact.

### Override Linkage





To eliminate excess movement, ball joints on the carburetor and special swivels on the servo arm are a must. Before installation, carefully polish each ball joint with a small amount of polishing paste to prevent binding. Use a variable-speed drill to slowly spin the ball inside the cup until it moves freely.

The linkage wire should be as short and straight as possible.

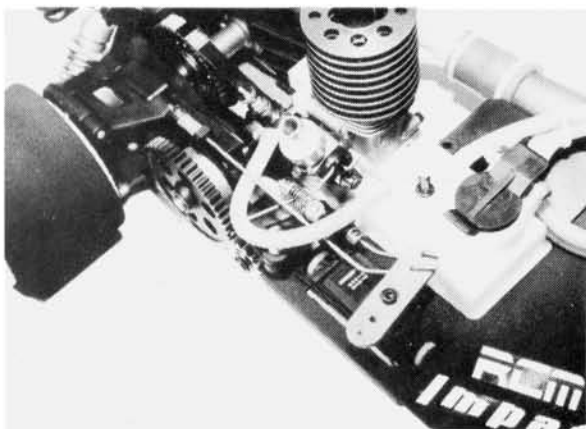
It may be necessary to maneuver the linkage around the fuel tank or roll bar, but try to keep bends in the wire to a minimum. Bends create flexing, and flexing creates slop.

Brake linkage is fairly easy to set up; it's usually a direct connection between the servo arm and the brake lever. Some racers use a spring on both sides of the lever to cushion the brake response and ensure that the brake is fully disengaged when the linkage is released. If the brake lever sticks, it could affect performance and cause engine strain.

Behind the lever arm there should also be a threaded end and a locknut, or a movable collar, so the brake can be dialed in or out manually. It should be easily accessible so that you or your pit crew can make quick adjustments during a race.

At the other end of the servo arm is the carburetor actuator linkage. It's more complicated than the brake because it must incorporate an "override" that allows the two functions to work independently. When the throttle is applied, its range should be limited to the full operation of the carburetor.

When the brakes are applied, however, the carburetor linkage must stop at the idle position to keep the motor running, while the brake linkage extends farther. The override on the throttle linkage wire is attached to the servo arm with a spring (see diagram) so that the linkage won't impede the brake as it reaches the idle position. BMT\* and Picco\* supply special throttle servo arms that have built-in spring overrides. These make set-up



**In some cases, the linkage uses only one side of the servo arm to control both the throttle and brake, as on this *Serpent Impact*. A slide carburetor could eliminate this complicated arrangement.**

much easier, but adjustment is still critical.

When the throttle and brake linkages have been arranged, each must be adjusted so that neither interferes with the other. With full throttle applied, adjust the length of the throttle linkage so the carburetor is fully open. If the servo proceeds past the full range of motion of the linkage, it may cause strain on the carburetor and servo gears, and it will drain the receiver battery. The linkage's range of motion can be adjusted by moving the link nearer to or farther from the center of the servo's rotation. It's equally important to ensure that the brake doesn't over extend or re-engage as the throttle is applied.

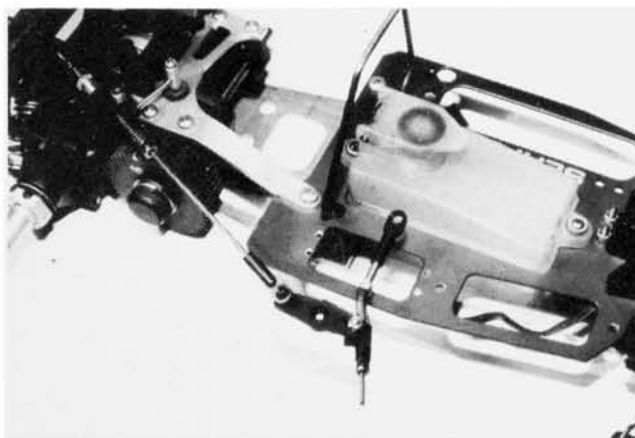
At the neutral position, the throttle should be at idle. If you prefer some "drag" brake at neutral, move the brake adjustment in so more brake is applied, but be sure that the brake is fully disengaged before the carburetor begins to open. The brakes on most gas cars are very efficient, so when they're applied, the lever should move only slightly. Adjust the brake to your

specific requirements, but remember that too much brake will cause the car to lose traction and skid.

In addition to the adjustments made to the linkage itself, most radio transmitters incorporate a variety of settings that further increase the racers ability to tailor the car's performance. The most basic adjustment is the servo end-point adjustment, or EPA. As the name implies, it determines the length of movement of the servo arm at both ends. When the linkage is in place, the full range of motion can be determined at the radio transmitter.

The high-point adjustment should limit the linkage movement to the carburetor's fully open position. The high point can also be used to break-in a new engine or limit the car's performance. The low-point adjustment should be used to determine the car's braking ability. At full brake, the tires shouldn't lock up completely, or the car will lose control and skid. Adjust the low point on the servo to prevent skidding. This will allow your car to dive into corners more aggressively and "out-brake" the competition without losing traction.

Throttle trim works much like the manual adjustment on the brake linkage.



**Some 1/10-scale kits include factory-installed throttle linkages. Although much of the work has been done, the manufacturers leave the tricky setup to the builder.**

Adjusting the throttle trim allows you to adjust the drag brake and the overall brake without adjusting the linkage directly. In some cases, the throttle trim doesn't move the EPA when readjusted, so check all your settings when you make any adjustments.

Exponential, i.e., rate, adjustments can



be very useful for customizing the throttle response. Usually, the servo moves at a constant speed as throttle is applied, but this doesn't necessarily yield a constant response from the engine. If the engine is particularly sensitive on the low end, the exponential adjustment can be used to dial-out response by making the



Use transmitter adjustments to fine-tune the linkage response. End-point adjustments (EPA) tailor the servo's range of motion, while rate adjustments alter the sensitivity of either the high or low end of the power curve.

throttle servo move slowly during initial travel. Less low-end "punch" can be helpful on particularly slippery tracks. To improve high-speed response on tracks that are very long and wide, you can make the top end more sensitive. As you experiment with the transmitter adjustments, you'll eventually find a combination that suits your driving style.

Before the resurgence of gas racing, adjusting throttle and brake linkage was becoming a dying art. Unlike those who run electrics, we're stuck with the sometimes complicated, always challenging process of linkage setup and adjustment. Don't be afraid to experiment. One combination isn't necessarily better than another.

\*Here are the addresses of the companies mentioned in this article:  
**BMT**; distributed by Racer's Choice, 6N258 Acacia Ln., P.O. Box 405, Medinah, IL 60157.  
**Picco**; distributed by Tidewater Engineering, 2406 W. Madison Ave., P.O. Box 1135, Bastrop, LA 71220.

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# PUBLISHER'S PAGE

by LOUIS De FRANCESCO

## WEATHERING THE STORM

The 1992 economic environment has tested nearly all industries across the country, and the hobby industry was certainly not held in exemption. While the hostile climate did deliver its share of the fiscal shakes, rattles and rolls to the R/C car industry, we have, thus far, come through it, albeit with a somewhat streamlined and changed face. Everything has its upside—even downturns in a country's economy.

While many leisure-time industries, such as skateboarding, currently appear to be fading fads, the R/C car industry has worked harder in these hard times to bring you, the consumer, better, more versatile products at lower prices. Manufacturers have done much to increase the value of what they offer, and R/C car enthusiasts are the beneficiaries. This turn of events drives one undeniable point home: the R/C car hobby/sport has earned its "seal of legitimacy" in the hearts of America's modelers from coast to coast.

## TAMIYA AMERICA

Looking back, the most ambitious undertaking of '92 was the establishment of Tamiya America in Aliso Viejo, CA. Tamiya has recognized the stability and viability of the North American market and has gone to great expense to establish its own distribution. Credit goes to early Tamiya entries like the Frog, the Hornet and the Blackfoot, which spawned the R/C revolution of the '80s. These affordable, yet durable cars were made for newcomers, and we're happy to learn that Tamiya will perpetuate this tradition of entry-level products in the future. To increase consumer awareness, Tamiya



*Clint Atkins (left), owner of Hobbico, and Car Action Publisher Louis DeFrancesco welcome Tamiya to American shores at the Aliso Viejo grand opening.*

America has embarked on a national television campaign and a series of mall demonstrations. We expect great things in the '90s from Tamiya.

## PRO-LINE SPONSORS TRACK DIRECTORY

We at *Car Action* are proud to announce that Pro-Line is now the major underwriter of the Track Directory. This directory is free of charge to track owners and is a great service to the industry; it gives tracks regional and national visibility to R/Cers both new and seasoned. Given the cost of printing this directory, we approached a number of manufacturers to help with sponsorship, and Joe Warren at Pro-Line has championed the cause. We salute Joe and other industry visionaries for their commitment to the growth of the R/C industry. Events such as these are undisputed evidence that the R/C car industry has developed into a diversified hobby that's here to stay.

See you in '93. ■



# Car Action's Christmas Wish List

**"H**o, ho, ho! 'Tis the season to be jolly!"  
"Yeah, yeah, Santa, whatever. Enough small talk; here's what I want!"

It seems that our little friend has been bitten by the "gimme" bug. Now and then it bites everyone, including us. So, if you could have any trick little goody that you wanted—with-in reason and some-what R/C-related—what would it be?

Along the lines of "The Twelve Days of Christmas," here are a dozen items that the staff of *Car Action* has deemed worthy of our annual Christmas wish list. Maybe some of these have made your lists, too. Happy holidays!

## We've been good...honest!

Calling James Bond! Talk about trick items! This high-tech mini-cam is small enough to fit in most R/C vehicles. Imagine piloting your truck as you watch the television set, patrolling your house on a stealth mission! The 2-inch-square micro video camera weighs 2.3 ounces and must be used with a micro television transmitter or a video sender unit (commonly known as rabbits). The Supercircuits PC-2ex produces 240 lines of resolution; it has automatic exposure control and can record in light as low as 2 lux. The camera operates on 9 to 13 volts DC, and only draws 95 milliamps. It sells for \$219.95. For \$3, Supercircuits will send you its catalogue of micro video cameras and transmitters.



### 1 SUPERCIRCUITS PC-2EX SPY CAM



### 2 DUDGEON RACING GAS RC10T

When we received our Dudgeon Racing gas RC10T, we were amazed by the work that had been put into it. We were even more amazed by its performance. The Dudgeon Racing 10T is a pure racing machine, and it handles as well as the electric RC10T. Its aluminum chassis, custom tranny and powerful O.S. Max CZ-R .12 engine put it at the front of the 1/10-scale gas truck racing pack. Dudgeon Racing also offers conversion kits for the Losi LX-T. The kits cost \$150, but if you send them your RC10T or LX-T, an O.S. CZ-R engine and \$200, they'll send you a complete, ready-to-run truck.



### TRINITY EVOLUTION 10 3

Pure domination! What else can we say? Joel Johnson convincingly took his Trinity Evolution 10 to the winners' circle in Pomona, CA, against some very stiff competition. Joel drove this car to win the first-ever On-Road World Championship. The Evolution should be rolling off Trinity's vast assembly line as you read this. In your hot little hands, this car could keep the competition on its toes!



### 4 TOMY ROBOT

You've seen him floating around the magazine for a while, and now he's back for more. Tomy's 1/20-scale TXR-002 is the first-ever fully functional robot. It comes as a kit with two microservo motors, an ESC module, a 4-channel radio (installed), a claw-type "manipulator" arm and a beam light. Options, such as a bullet-shooting right arm with a 10-shot magazine (don't worry, mom and dad—not REAL bullets!), and a jabbing left arm are also available.

Its newly developed Active Linkage System makes the robot's rotating movements, i.e., of its head, arms and waist, seem even more realistic. All this can be yours for just \$499.



The Yonezawa Pit Gear 1/52-scale mini-racer comes with a transmitter that doubles as a charger. Powered by a miniaturized motor and four Sanyo 50mAh cells, run time comes in at a whopping one minute, but it only takes 45 seconds to

### YONEZAWA PIT GEAR

### 5



charge the car, with help from your transmitter. Its 2-inch wheel-base makes this car very nimble. It has proportional steering with forward and reverse speeds and, although it's small, its speed is surprising.





**6**

### CHRIS CHIANELLI'S HAIR

It may be too hip, but come on now...who among us *doesn't* want Chris's hair? We're talking style here! It isn't a fad, ladies and gentlemen; it's here to stay—even through a nuclear blast. Through the years, Chris's hair has undergone many a change of style and color, but we're still unsure of its actual texture. Tentacles optional.



### CLIFF LETT DRIVING SEMINAR

Smooth and consistent. Nerves of steel. Cliff Lett: the man, the driver, the legend—in his own mind, that is (just kidding, Cliff). Wouldn't we all like to drive as well as Associated's main man? Imagine, a few hours in which Cliff shows you the ropes of R/C racing at its best. How to pass, picking the right lines through heavy traffic, avoiding dreaded pile-ups and, best of all, how to win! Hey, it could happen, right?

### KYOSHO FERRARI 643

**8**

When Kyosho's stunning 1/8-scale Ferrari 643 Formula 1 racer arrived, it created more than just a mild stir. We can honestly say that the 643—with its detailed, double-wishbone suspension, inboard-mounted, coil-over shocks and meticulously molded polycarbonate body—is the most accurate R/C kit representation of a full-size racing car ever produced. At the heart of this Ferrari is a powerful O.S. Max CZ-R .12 gas engine that provides serious ponies and adds the sound and smell of a full-size race car. For the ultimate in R/C realism, ask Santa to put one of these babies under your tree.



**9**

### JR R-756 TRANSMITTER

You've tweaked your car to its maximum performance. You've spent hours practicing, perfecting your driving skills—and it has paid off. You're in the A-Main! You put your

car down, and it immediately starts to glitch! Oh, no! That cheap transmitter is getting hammered by the more powerful signals coming from your competitors' FM and PCM radios.

How do you fight back?—with JR Propo's new R-756 transmitter. It has all the latest features: FM or PCM operation at the push of a button, throttle and steering trim alarm, fail-safe warnings so no one can mess with your settings, and the capacity to store settings for up to six models! With the R-756, when you mount the drivers' stand, you'll always know that your trim settings are secure and that your signal will get through. Confidence awaits!



### 10 HPI 10L ACCESSORIES

Bolt-on modifications, for performance or for appearance, give a car individuality. Hobby Products International (HPI) makes a complete line of accessories for Associated's popular 10L. Replacement chassis are available in a variety of configurations, and just about every top on-road racer uses HPI's front-suspension brace. Mounted foam and rubber-capped tires and wheels are available in compounds to suit any track. If you had the damper post brace, the rear pod (with lower kick-up), the nerf bars, the hubs and the wing mounts, you could almost build an "HPI10L"! Top it all off with HPI's low'n'wide Silk Cut Jaguar body, and you'll have one hot roadcourse machine.



**BMT 891**

**11**

It's the current IFMAR 1/8-Scale World Champ; it can go from 0 to 60 and back to 0 faster than just about any full-size car. The BMT 891 incorporates all the latest 1/8-scale on-road technology: independent suspension with oil-filled, coil-over shocks at all corners; upper front suspension arms that automatically adjust the car's caster to optimize its steering capabilities; and a precise disk-brake system. Just add the optional three-speed transmission and the one-piece rear drive hub to make a carbon-copy of Lamberto Collari's Worlds winner. Bolt in a .21-size gas engine, and you can take on all comers.

### 12 RADIO CONTROL CAR ACTION

Info you can't live without. That's what we give you each month.

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Nowhere else can you get the vast amount of R/C information that you'll find between the covers of *Car Action* or our special issues. Issues such as *Radio Control Off-Road*, *R/C Monster and Racing Truck* and our annual *Buyers' Guide*. There's only one way to guarantee that you won't be left out of today's fast-moving R/C world: subscribe!







# A WINNING ATTITUDE

PART TWO

**A** WINNING ATTITUDE is the consistent display of courtesy and fair play. Start with the attitude that R/C racing is something to do for fun. On race day, observe track rules strictly, and follow the unwritten laws of track etiquette to ensure that everyone has a good time.

Driving your car is only one part of race day; you spend more time marshalling, working in the pits and watching others race. Most opportunities to have fun and to help others come when you aren't competing. Last month, I explained how to develop a winning attitude on the drivers' stand. This month, we'll look at the other parts of race day.

## TURN-MARSHALLING ATTITUDE

How you marshal can make or break your reputation; in a second, you can go from



**Turn marshalling requires concentration. Keep an eye on your part of the track and don't watch the race. These two are kneeling so drivers can see over them.**

by STAN VANDRUFF

saint to scoundrel. To be a reliable marshal, you must maintain your concentration. It's surprisingly easy to miss a wreck just a few feet from you if you're looking in the wrong



**Cars on the track have priority. If you work on a broken car, you still have to keep a close eye on the track (this young man is). Stay low so drivers can see over you.**

place. In a close race, one foul-up by a marshal can cost the leader his trophy. Few rules are written for marshals because the job seems so simple, but to do a good job, you must stay on your toes. You'd better remember the golden rule too, because others will soon have their chance to do unto you.

Monitor your section of track. You don't have time to watch the race or chat with your

friends. If you can, sit or kneel so that you don't obstruct the drivers' views. Try not to run in front of other cars to retrieve a wreck, and make sure that the track is clear of oncoming cars before you put down a car.

Try to put cars back on the track in the order that they crashed. Be especially careful to point cars in the direction of traffic—not toward a wall. Make sure that the drivers can see where you put the car. I've seen them placed behind walls—even backward on a winding off-road course. If a driver can't see his car when he hits the throttle, you'll have to retrieve it again.

Driving by R/C isn't easy (you knew that). When cars wreck or run off the track, drivers need marshals to keep them from losing time. When you're on the drivers' stand, you appreciate the difference between a good marshal and a bad one. Some R/Cers don't like to marshal, but I love it. I want to do such a good job that when other drivers marshal my car (too often) they try to give me top service (I need all the help I can get).



**I don't usually have a telephoto lens on the driver's stand, but I needed one to find my RC10 behind this wall. When you return a car to the track, make sure that the driver can see it!**

## COURTESY IN THE PITS

The pit area is a world apart from the rest of the track. Here, things are more relaxed and we can broaden our attention to include the people around us. This is a good place to meet new people, swap stories, compare notes and share secrets.



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## WINNING ATTITUDE

If you're one of the better drivers and you see someone having trouble, offer your advice; lend him tools or parts—whatever he needs. If you need help, don't be afraid to ask questions. Most people love to share their knowledge. At a recent event, I overheard someone ask, "In what other racing sport will your opponent give you advice—maybe even lend you his motor?"

Remember, this is a hobby, and the goal is to have fun. Introduce yourself to new people at the track. Make friends and try to interest others in the sport. If you talk about yourself or your car, don't brag (everyone else will fall asleep).

Never turn on your transmitter during a race. Even if it isn't on the same frequency as another driver's, your radio can emit off-frequency signals that can cause interference.

Don't talk to the marshals; it distracts them from their jobs. Don't let yourself be distracted either. Know the time of your next race and your position in it. Be on time to the starting line and return your transponder promptly after the race.

### SPECTATOR COURTESY

You probably don't spend much time just watching a race, but when you do, try to learn something from the drivers. Choose a good driver and watch how he handles the track. Compare his actions with yours and with those of the other drivers. Between races, wander into the pits to see what you can learn there. You could, of course, just relax and cheer your buddies, but don't cheer your favorite so much that it distracts him or the other drivers. Never boo a driver—that's childish.

If you go into the pits, don't talk to the racers so much that you interfere with their preparation for the next race. And don't get in the way of the race officials or block entrances to the track or drivers' stand!

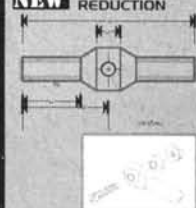
### IN 75 WORDS OR LESS

There are no life-or-death situations in R/C. Don't worry about your bad days. Forgive others when they have them. Play fair. Learn as much as you can and practice, practice, practice. Good driving is a true courtesy (and it even helps you win). The next time you're at the track:

- Encourage others.
  - Don't complain.
  - Make positive suggestions.
  - Remember the golden rule.
  - Set an example with your winning attitude.
- Special thanks to James Radford, track director at Doug's Hobby in Waldorf, MD, for teaching me many of these things by example.

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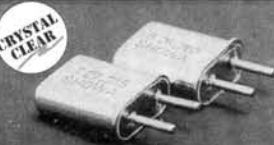
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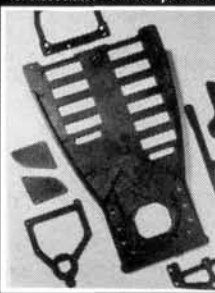
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# Top 10 Innovative R/C Cars of All Time

TIME WARP

by JOHN HOWELL

R/C technology is never at a standstill. If you look back over the past five years or so, you'll notice a steady increase in the research and development of racing cars and trucks. Early top-of-the-line R/C cars served as launching platforms for today's high-tech machinery. Without crucial advancements from such companies as Associated, Kyosho, Tamiya and Team Losi, we'd all still be driving R/C Fred Flintstone mobiles.

*Radio Control Car Action* debuted as a quarterly in the winter of 1986, and it has since grown into the formidable front-runner of the R/C magazine industry. We've watched the R/C industry grow, and it has been astonishing. A few groundbreaking machines thrilled us the minute we saw them. Here are our picks for the 10 most innovative R/C cars, in order of their appearance in *Car Action*.



## TAMIYA: TOYOTA 4X4 BRUISER

Winter '86

Photographer: Louis V. DeFrancesco Jr.

### ON-THE-FLY 3-SPEED TRANSMISSION

One of the most realistic R/C vehicles, Tamiya's Toyota 4x4 Bruiser entered the market early. The Bruiser's most special feature was its 3-speed transmission. With a 3-channel radio, you could shift from 2WD to 4WD "on-the-fly" from your transmitter. An overload clutch protected the motor and transmission.

Scale leaf-springs supported the aluminum frame that had solid front and rear axles, and a single, oil-filled shock at each wheel. Another of the Bruiser's key features was its large, 4000mAh battery that provided run times of more than half

an hour. The big, semi-pneumatic tires had no trouble rolling over rough terrain. Not much stopped this truck.

## TEAM ASSOCIATED: RC10

Winter '86

Photographer: Louis V. DeFrancesco Jr.

### FIRST LIGHTWEIGHT, PURPOSE-BUILT RACER

In the early '80s, Associated's original RC10 was considered the ultimate weapon. The "deluxe kit" included not only the car and a full body kit, but also an Associated/Yokomo stock motor, a 6-cell battery, a charge cord and ball bearings. The ever-popular aluminum tub chassis is still available. The original transmission had Associated's fully adjustable Vari-Lock ball differential, and dogbone axles drove the rear wheels. Large, knobby tires graced the rear of the RC10, while narrow-ribbed tires provided spot-on

steering up front. (Adapters were even offered to allow the use of other brands of wheels.) The RC10's oil-filled shocks had precision drill-blank shafts with double-end seals and machined-aluminum bodies. Nothing could touch the RC10 on the track, and as the years (and many refinements) have gone by, the RC10 has remained a dominant force on the tracks.





# Top 10 Innovative R/C Cars of All Time

## KYOSHO: 4WD OPTIMA

Spring '86

Photographer: Louis V. DeFrancesco Jr.

### FIRST 4WD RACER WITH INDEPENDENT SUSPENSION

The Yokomo Dogfighter was the first successful 4WD electric race car, but Kyosho's Optima was far more advanced. It was the first 4WD to offer front and rear, double-wishbone A-arms. Each arm was damped by its own coil-over, oil-filled shock.

The kit's more impressive features were an aluminum



chassis with fiberglass supports, a BEC resistor-type speed controller and a sturdy chain-drive system that enabled racers to alter the drive ratio, i.e., change front to rear drive bias. The car's performance was awesome for the standards at the time.

## TAMIYA: HORNET

Summer '86

Photographer: Rich Uravitch

### SPURS AFTER-MARKET EXPLOSION

When the Hornet entered the R/C market, Tamiya obviously hoped it would sell well—and it did. Tamiya has sold more than 500,000 Hornet kits since its introduction in early '86. The Hornet enabled newcomers to get into R/C at a relatively low cost, and it sparked major growth in the

after-market industry. Virtually every after-market company offered a multitude of trick items for the Hornet. The very simple, durable kit had a planetary gear diff and a reliable 540 motor. Novices liked it so much because they could "accidentally" run it head-on into a curb at full speed and it would still go afterward. A hotter motor transformed this already light car into a rocket! (Unfortunately, it didn't handle quite as well that way.) The Hornet reigned supreme in the entry-level category.



## MARUI: BIG BEAR PICKUP

Summer '86

Photographer: Jack Seid

### FIRST MONSTER TRUCK KIT

The Marui Big Bear Datsun pickup was the first 1/12-scale monster truck with large, semi-pneumatic tires. Because it was easy to build and extremely durable, its popularity soared with the entry-level crowd. Although it wasn't overflowing with major technological advances, the Big Bear was a model for many other R/C monster trucks. An M480RS motor supplied the power to the reliable bevel-gear rear differential, while the less-than-adequate coil-spring suspension soaked up moderate bumps. The tires were the main suspension components.



The Big Bear provided countless hours of trouble-free running, that is, if you had enough batteries! Wheelies were its strong suit, and if you happened to run head-on into an object, there was no need to worry, because a burly, spring-loaded front bumper protected the truck.

Another key selling point was its low price—\$99.95. Most mail-order distributors sold the Big Bear for the even more attractive price of \$69.





## RPS: YOKOMO SE 4WD

Summer '86

Photographer: Louis V. DeFrancesco

### REFINED, RACE-READY 4WD

The original version of Yokomo's Dogfighter required too many hop-up items—a graphite chassis, dual rear shocks and a slipper clutch—to make it a competitive racer. Enter its replacement—the Yokomo SE! The SE (Special Edition) included a Yokomo .05 stock motor, a 14-tooth brass pinion, a simplified slipper clutch, new, lower front-suspension arms, a new front shock, hardened front

axles, a 1:1 front wheel drive ratio, steel-shaft transmission gears, a roll-bar system with a redesigned rear suspension, heavy-duty rear trailing arms, a new, lightweight fiberglass chassis and Team Losi tires. What was so innovative about the SE?—the fact that you didn't have to spend \$500 or more to make it work. The SE sold through mail-order for about \$200.

## TAMIYA: BLACKFOOT

February '87

Photographer: Louis V. DeFrancesco Jr.

### THE FIRST "RACING" TRUCK

The Blackfoot monster truck quickly followed in the Big Bear's footsteps, but as soon as it was off and running, it was evident that it was far superior. The Blackfoot's chassis was borrowed from one of Tamiya's earlier proven cars, the Subaru Brat (which later became the Frog). The Blackfoot is the best-selling R/C truck, and it can be credited with starting the truck-racing craze.

The durable, ABS resin chassis and 4W, independent suspension made it track-friendly, but its rear dogbone axles were a weak link. After a short time, the dogbone's hex heads became rounded off, and the truck went nowhere. After-market companies quickly jumped on the Blackfoot bandwagon, and go-fast goodies and hop-ups became readily available. With a few minor modifications, the Blackfoot quickly became a favorite.



## TAMIYA: CLOD BUSTER

April '88

Photographer: Steve Pond

### 4WS, TWIN-MOTOR MONSTER TRUCK

Enter the "King of the Beasts": the Tamiya Clod Buster. The mighty Clod set a new standard in the R/C car-crushing world with its behemoth tires, twin 540 motors, 4WD, 4WS, power/economy switch and highly detailed Chevy body. The Clod Buster stopped for nothing (except for a fresh battery when needed). The monster-truck tires were more than enough for mild terrain, but soon after its release, many companies came out with pulling, i.e., spike, tires of the same size.

One complaint from Clod Buster owners was that the kit came with cheap plastic bushings. Replacing the bushings (there were plenty of them) took a lot of work and money. Hotter motors, after-market chassis, revamped suspension systems, and many other trick items transformed an ordinary Clod Buster into a brutal pulling machine.



# Top 10 Innovative R/C Cars of All Time

## TEAM LOSI: JR-XT

July '90

Photographer: Rick Houle

### THE FIRST OUT-OF-THE-BOX, RACE-READY TRUCK

The first real "stadium racing" R/C truck, Team Losi's JR-XT, was built to withstand the punishment that tracks threw its way. It was designed strictly with racing in mind. This creation wasn't a Blackfoot or Big Bear that had to be extensively modified to be competitive; it was successful right out of the box. Its components included: a long graphite chassis, full ball bearings, a low-rotating-mass transmission with 48-pitch, self-lubricating gears, wide front arms, genuine rubber tires, three-piece rims and a five-link rear suspension system. The JR-XT set the standard and dominated the track.



## KYOSHO: FORMULA 1 FERRARI 643

August '92

Photographer: John Huber

### SCALE MODEL REALISM

Kyosho's F1 Ferrari 643 makes our list because it's one of the most awesome and realistic cars to come through our office. The Kyosho scale replica shares many features of the full-size Ferrari 643, such as its metal-reinforced, double-wishbone front and rear suspension. A front sway bar hinders chassis roll, and the two aluminum, oil-filled, coil-over front shocks are tucked away underneath the plastic nose cone, thus reducing the drag coefficient. An engine-driven fan inducts air over the cylinder head to cool the CZ-R .12 engine.

The F1 has an excellent disk-brake system for super stopping power and, for increased realism, Kyosho added small brake disks, and calipers for each hub carrier. They aren't functional, but you can see the setup through the rims, and it looks awesome! The CZ-R engine comes equipped with a pull-start—another nice feature. All you need is fuel and a glow plug, and the ultimate in scale Formula 1 racing is all yours.



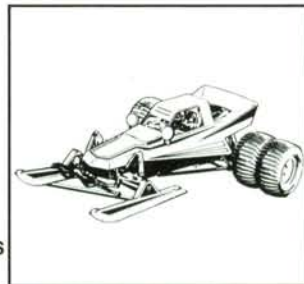
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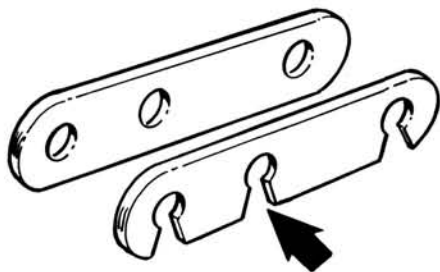
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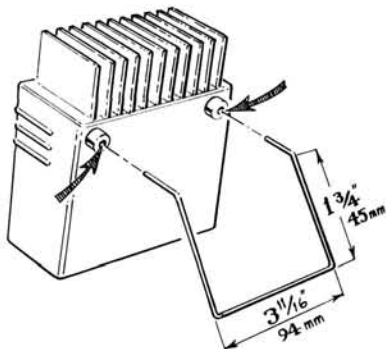






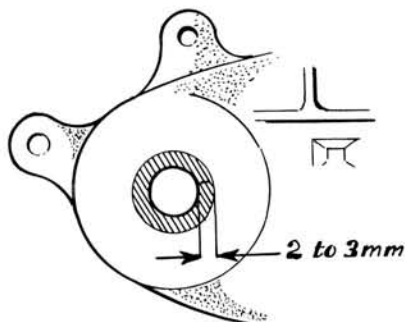
### RC10L QUICK-CHANGE CAMBER/CASTER ADJUSTERS

Trim out the areas as shown. Now, instead of completely undoing six screws to remove the shims, just loosen the screws, slide out the shims, and slide in different shims before you tighten the screws again. *Brett Slattery, Cairns, Queensland, Australia*



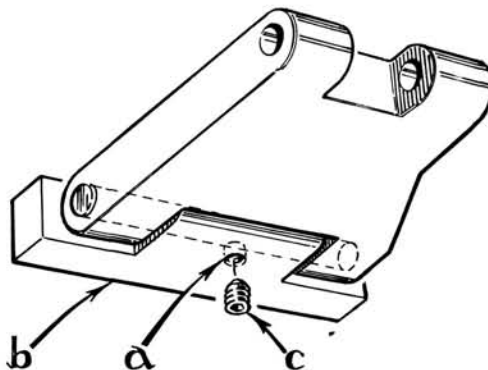
### TEKIN CHARGER STAND

After you've made sure that the unit has been disconnected from the electric supply, drill out the feet in the back of the charger, then bend up some 1/16-inch music wire to the dimensions shown in the illustration to make this handy support to hold the charger at a convenient angle. *Richard Miller, Enfield, CT*



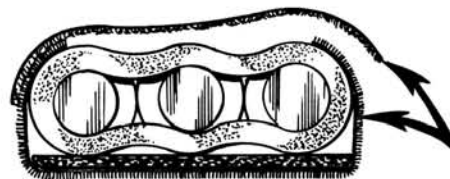
### PINION QUICK CHANGE

Instead of opening up the whole gearbox to change pinions, increase the diameter of the motor-mount hole by 2 or 3mm. The larger pinions will now fit through. *Mats Nilsson, Rooty Hill, NSW, Australia*



### CAPTIVE PIVOT PINS

When assembling a car, drill out the suspension mounts (b) with a no. 41 drill (a) then screw in pinion setscrews (c) and tighten them on the pivot pins. This will retain the pins, even if you lose the E-clips. This diagram shows the unit from an RC-10. *Martin Blais, Stanton, CA*



### NI-CD PACK SECURITY

Although this method was originally used on cars that were equipped with saddle packs, it will also work on most others. Strips of Velcro® that have been cut to fit around the chassis will hold the packs firmly in place. You could attach the bottom piece to the chassis with double-sided tape for convenience. *Hayward Butler Jr., Roskilde, Denmark*



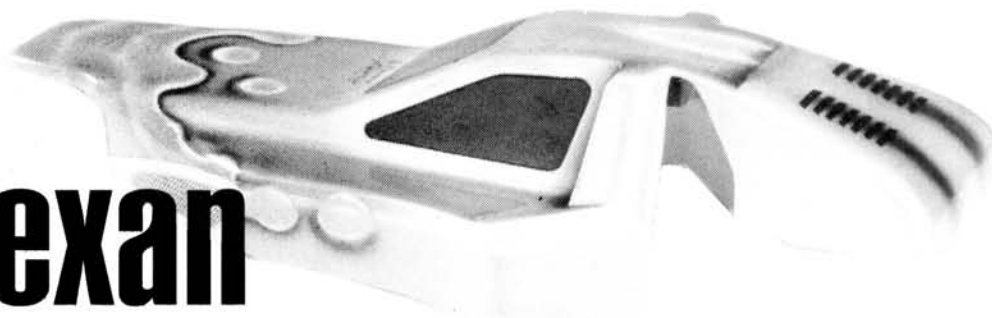
### BEARING BUBBLE BATH

Put the bearings in a tea strainer and suspend it in a small cup of water. Add a couple of denture-cleaning tablets; the fizzing will effectively agitate the dirt from the bearings. Inject a water-dispersing lubricant, e.g., WD-40, into the bearing immediately afterward. *Mathew Meyers, W. Columbia, SC*



HOW TO

# Trim Lexan Without Fouling it Up



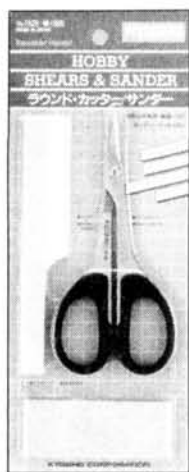
A little bit of this, a little bit of that...a touch more blue, then some yellow...finally, after hours of pains-taking work, you've finished. You put down your airbrush, turn off your compressor, and stand back to admire your best-ever paint job! Then it's off to the kitchen cabinet for the worn-out sewing scissors so you can cut out your prized body. Wait a minute! Are you sure you want to do that? Do you want to risk messing up your masterpiece with tools that aren't up to the task? Take your time and do it right.

we show you the right way to do it

by JOHN HOWELL

## TOOLS OF THE TRADE

Before you cut out a Lexan body, you must arm yourself with the proper tools: an X-Acto knife, Lexan scissors, a flexible straightedge (a ruler or a small drafting triangle),  $\frac{1}{4}$ - or  $\frac{1}{2}$ -inch masking tape, a wheel-well template, a black, fine-point, permanent marker, plastic food wrap, a sanding block and medium-grit sandpaper. (If you have a Dremel tool with a sanding drum attachment, it's much easier to use than a block and sandpaper).



## ATTENTION EDWARD SCISSORHANDS

Scissors that are designed for Lexan make cutting out those tough wheel wells and intricate curves that much easier. They also come in handy when you work on special projects that have a lot of curves, such as off-road cars and trucks, or full-fendered classic cars. Unless the body you're working on has a molded-in trim line, mark the cutting line with tape or a permanent marker, then snip with short strokes. For long, straight sections, regular scissors will work well enough. After you cut, don't forget to inspect for rough edges.

The following companies offer Lexan scissors:

Tamiya America Inc., 101 Columbia, Aliso Viejo, CA 92656.  
Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.



**Step 1** Before you cut into the Lexan, cover the body with

plastic wrap to protect it from scratches. If you're a beginner, it's best to trim the body before you paint it. If the knife or scissors slip, you won't scratch the paint job you worked so hard on. If you insist on painting first, pay special attention when you cut and trim.



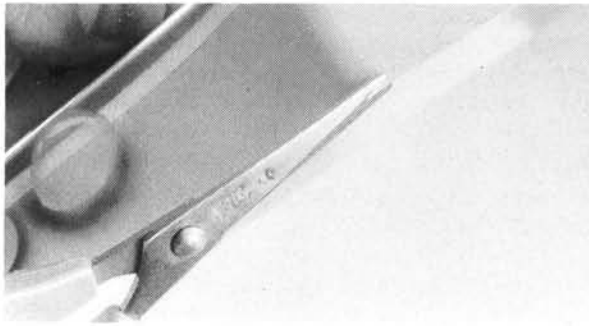


**Step 2** Remove the Lexan flashing on the body's lower edges. To get the straightest cut from your hobby knife, snap off the sharp tip of the blade with pliers. The knife will hold a straight line much more easily, and it won't "wander." Put the body on a flat surface and cut along the flashing, just above the molded-in cut lines. Make a single pass, but don't cut through the Lexan; fold it away from the cut and it will snap off easily.

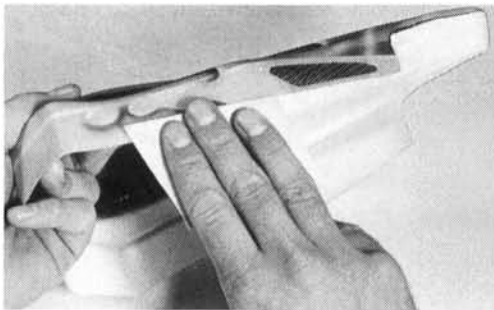


Remove all of the flashing from the body, and trim all of the straight areas—between the wheel wells, across the front and rear, and from the wheel wells to the corners. Score the wheel-well openings with the knife, but don't remove them yet. This will help to keep the body rigid if you paint it after you cut it out. It will also protect the area from overspray.

**Step 3**



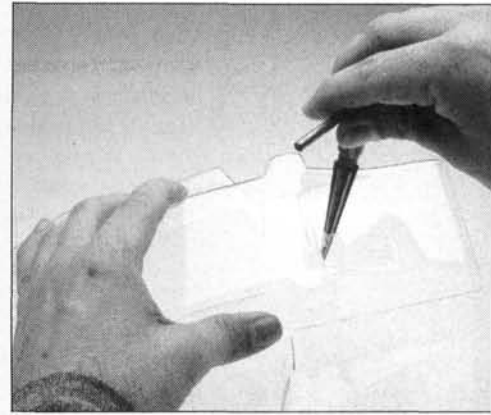
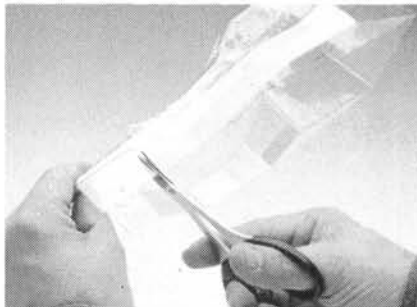
**Step 4** Work toward the corners and remove any remaining Lexan. Check for jagged edges around the front and rear of the body, and trim them away. It's much easier to work with small sections in the straight areas. After you've removed the excess Lexan, a light sanding of the edges will smooth things out. From here, the only thing that's left is the dreaded wheel-well encounter.



Most would agree that the hardest part of trimming a Lexan body is cutting out the wheel wells. Many people have ruined their first Lexan bodies because they rushed through this step. It's wise to make a wheel-well template, mask out the body with a permanent marker, and then cut. This is where the curved Lexan scissors come in handy; they'll help you to cut around curved edges smoothly.

(Continued on page 46)

**Step 5**



## MOUNT 'EM UP

After you've painted and trimmed that awesome body, you have to mount it on your chassis. Here are two ways to do this.

**1** Cut off the top part of the body post (where the body clip goes), and attach a large, flat washer to the remaining part. Drill a small hole through the washer and the body post, and attach the washer to the post with a small, self-tapping screw. Apply an adhesive Velcro® dot to the top of the washer, and put the other piece of Velcro® inside the body so that it matches the one on the body post.

**2** If you plan to race, this method is your safest bet. Drill holes in the body for the mounts, and use pins or nylon nuts to secure the body. (It's easier to do this before you paint the body.) Mark the body-mount positions on the outside of the body. To start the holes for the mounts, poke a small hole with a hobby knife. Enlarge the hole to the proper size with a reamer. If you use a drill, start with small drill bits, and gradually work your way up to the size you need. If you start with a bit that's too large, you might tear the Lexan. You could also use a Dremel tool that has a tapered grinding-stone bit (the further you push the stone through, the larger the hole will be), but the simplest way to cut holes in your Lexan body is to use Trinity's\* Lexan hole punch; it does the job quickly and efficiently.

\* Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036.



Step  
6

Carefully check for any jagged edges and trim them away. Smooth out any flaws with your sanding block and medium- to fine-grit sandpaper. Use the Dremel tool with a sanding drum to smooth any curved areas.



## KEEP YOUR LEXAN CRACK-FREE

Let's say you've cracked your favorite body. It was your best-ever paint job, and you don't want to throw it out. What's your next step—superglue? Tape? Unfortunately, these just

don't cut it. Now, T&A Machine Products\* offers the Thunder Repair Kit.

The Thunder Repair Kit includes adhesive, four applicator sticks and four sheets of flexible, mesh Super Shock Cloth to cover cracks and support damaged areas. If your R/C car has a cracked Lexan body that's destined for the trash can, give the Thunder Repair Kit a try.

\*T&A Machine Products, 2286 Via Burton, Anaheim, CA 92806.

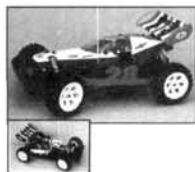
As with any craft, practice makes perfect. Although your first attempt may not seem spectacular, don't give up! It takes a lot of practice and a lot of patience to get that concours-winning body. You may want to buy a few sheets of Lexan so you can practice cutting and following lines. If you feel frustrated while you're cutting, let it sit for a while, and then come back to it. I've seen many projects ruined by lost tempers. Remember, Rome wasn't built in a day, and you probably won't be an expert overnight; but it's a nice feeling when that ultra-trick paint job is accented by an even better body! ■

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### PIRATE M1

1/8 Scale Gas Power Race Buggy



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# SPEEDWORKS SPORTSMAN CUP RACE

by MIKE LEE

**F**OR MOST OF US, the essence of racing is heading to the local track and taking on the other racers in friendly, heated battles. Usually, it's a treat to head to a major race and test your skills against drivers who are often pretty good. The dream ends when you realize that all the "normal" guys are about to be slaughtered by the drivers you read about in the magazines.

This isn't a pretty sight, and we're all convinced that if we had their motors, their batteries

and their light cars, we could do that well, too! Ernie Provetti of Trinity heard about those feelings, and the result was the Speedworks Sportsman Cup

Challenge. In this three-race series, Ernie set the rules of the game to ensure that an equal chance would be granted to us mere mortals. The result at race number two was awesome.

Race two was held on June 5, 6 and 7, 1992 at the Ranch Pit Stop in Pomona, CA. This well-known site had just been renovated for the 1/10-Scale World Championship race and provided a challenging course for all. The track also has a new owner—Jim Halsey. Yup, same guy who brought you Jay Halsey. We expected three days of exciting race action and fun.



PHOTOS BY MIKE LEE



**Above: the Saturday evening meal was great. Here, Jim Halsey chows down with Jay Halsey, Kevin Maurer, Joel Johnson and John Thawley.**

**Right: Joel Johnson's car led the pack at the start of the Main.**



**George Flores (left) and Carlo Bruno (right) pose proudly with their Concours-winning combos. This is the second consecutive year in which Carlo has won Concours at one of the Speedworks races.**





The Concours winners (from top): Carlo Bruno's Valvoline Nissan, Raul Villavicencio's Bud Dry Lotec and George Flores' Jaguar.

May the best driver win!



## THE ODDS ARE EVEN

The rules of the game were simple. Any non-sponsored driver could enter, and sponsored drivers would fight among themselves in the Invitational Class. All drivers had to run with a handout Speedworks motor—an Epic slotted armature with 24-degree timing. There was also a handout battery pack (of Trinity 1400mAh SCR cells), and a specified minimum weight of 45 ounces. At this weight, nobody had the advantage of a super-light car. What a novel way to even the odds.

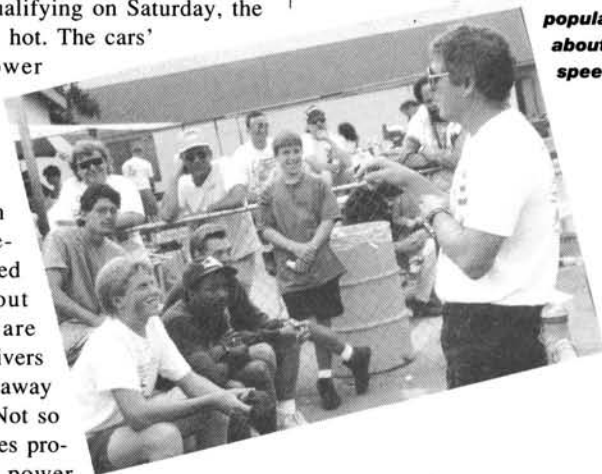
Of course, you'd think that slick-handed drivers could beat this type of format. After all, we've heard of (and sometimes even seen) drivers who pop open stock motors and do their thing to them. Battery packs have been switched to stronger cells; some cars can even (conveniently) discard their lead weight in a race *after* they've been weighed. Not in *this* race.

Drivers had to hand in their motors and batteries at the end of the race day. The factory-assembled battery packs couldn't be taken apart and the solder tabs couldn't be tampered with. In fact, you couldn't even run a bead of solder across the tops of the tabs to

busy cycling their packs for better performance. We did this in the *Car Action* pits, but the packs improved only very slightly. I must admit, Trinity knows how to play the game.

During the qualifying on Saturday, the competition was hot. The cars' speed and power were the same, so the drivers had to do all the work. As we've experienced in other races despite the so-called "stock" handout motor, there are always a few drivers who simply run away from the pack: Not so here. The batteries provided plenty of power for the 4-minute runs, but stock motors must be geared for both power and speed, so there's usually only one "hot" ratio to be found. The pack can only put out so much power, and that's all you get.

**Bob Novak held a popular seminar about chargers and speed controllers.**



**The site of the 1992 1/10-Scale IFMAR Worlds, the Ranch Pit Shop track has hosted many national championships.**

improve power flow. Each car was teched after the heats and Mains, so their weight had to be maintained. Given these rules, it was pretty tough for anyone to get an unauthorized edge.

Friday was the practice day. Quite a few drivers checked out the track layout, and this made things much easier for them in the next couple of days. Drivers who had equipment to match or hard-discharge batteries were

There were seminars about motor tuning, battery charging—even what the top drivers do to prepare for a major race. These were popular between race rounds; in fact, they kept the atmosphere lighthearted and relaxed.

The weather on Sunday was the best of the weekend—clear and bright—and the Concours event took place first thing that morning. The winners were Carlo Bruno's Valvoline Nissan GTP-ZX, Raul





## SPORTSMAN CUP RACE



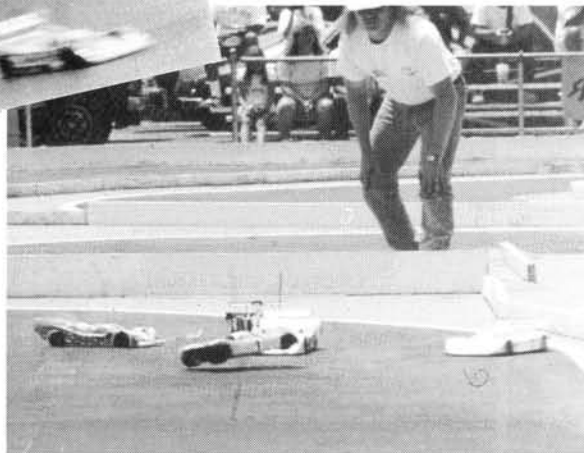
**High-flyin' smash-and-crash accidents are bound to happen at these speeds!**

Villavicencio's cool-looking Bud Dry Lotec GTP and George Flores' very nice Castrol Jaguar GTP. Carlo's win is his second in a row at a Speedworks Conours event.

### SPEEDWORKS QUALIFYING

Alex Schuck took the top qualifying position for the Sportsman Class. He was the only driver in this class to top 15 laps. Behind him were nine other hot drivers separated by only 11 seconds! The second driver in line was Louis Lin, who was followed by Mike Critelli. In the Invitational Class, Joel "Magic" Johnson led the field with a couple

of impressive drives. Not only did we watch Joel's car during the qualifiers, but we listened to it as well. Believe me, when you hear how Joel uses the throttle, you'll understand how smoothly this man drives. Behind Joel



were Tyree Phillips (with some great driving) and Andy Dobson. Just one lap separated the first and last drivers.

There were a lot of prizes, and nearly every driver took home one or two, making the race that much more rewarding. The

Grand Prize of the event included a JRX-Pro off-road car, an Airtronics Caliber radio system, a Speedworks shirt, a Novak speed controller and charger, Trinity motors and batteries and the almighty *Car Action* one-year subscription. What a deal for Andy Carlson of Ontario, Canada. His father bought a raffle ticket and gave it to him. Nice goin', dad!

The Mains saw some awesome, fierce action.

♦ **Sportsman C-Main.** All 10 cars finished within 10 seconds of one another! Watching this race was like watching a train go around the track; the cars were close and in line. If you made a mistake, you went to the back of the pack. Mike Whenry made the fewest mistakes and took the win.

♦ **Sportsman A-Main.** This was almost as good, but the leaders went berserk on the field and wiped out a few of the back markers. Early on, Alex Schuck took off with the holeshot and left everyone else to tangle. Paul Smith and

Chuck Howell got through, and the chase was on. Schuck bobbed to the wall, so Smith took the lead and Howell claimed 2nd. It didn't last too long for Smith; he ate it in traffic, and Howell took off. Howell won, with Smith 2nd and Schuck 3rd.

### 1/10-SCALE SPORTSMAN



| FIN | QUAL | NAME             | CHASSIS          | MOTOR | ESC        | RADIO      |
|-----|------|------------------|------------------|-------|------------|------------|
| 1   | 4    | Chuck Howell     | Associated RC10L |       | Tekin      | Airtronics |
| 2   | 1    | Alex Schuck      | Comp Craft       | h     | Tekin 411G | KO         |
| 3   | 5    | Paul Smith       | Bolink           | a     | Novak      | KO         |
| 4   | 7    | Chuck VanDeWeghe | Twister Cyclone  | n     | Tekin      | KO         |
| 5   | 10   | Martin Schlosser | Associated RC10L | d     | Novak MXc  | Airtronics |
| 6   | 2    | Louis Lin        | Associated 10L   | -     | Tekin 408  | Airtronics |
| 7   | 8    | Bill Martin      | Associated 10L   | o     | Novak MXc  | Futaba     |
| 8   | 3    | Michael Critelli | Bolink           | u     | Novak      | KO         |
| 9   | 6    | Todd Throne      | Associated 10L   | t     | Novak MXc  | Airtronics |
| 10  | 9    | Scott Burns      | CKW/J&R Design   |       | Novak M1c  | Airtronics |

### 1/10-SCALE INVITATIONAL



| FIN | QUAL | NAME            | CHASSIS                   | MOTOR | ESC       | RADIO      |
|-----|------|-----------------|---------------------------|-------|-----------|------------|
| 1   | 1    | Joel Johnson    | Trinity ReFlex 10         |       | Novak M1  | Airtronics |
| 2   | 2    | Tyree Phillips  | Associated/Phillips/Logan | h     | Novak M1  | KO         |
| 3   | 5    | Jay Halsey      | 10L                       | a     | Novak M1  | n/a        |
| 4   | 3    | Andy Dobson     | Comp Craft Lynx II        | n     | Novak     | Futaba     |
| 5   | 7    | Ron Schuur      | Associated RC10L          | d     | Novak     | KO         |
| 6   | 9    | Kyle Reed       | Street Weapon 10L         | -     | Novak M1c | JR         |
| 7   | 8    | Jack Johnson    | HPI 10L                   | o     | Novak M1  | JR         |
| 8   | 6    | Frank Calandra  | Corally SP10G             | u     | Novak M1  | JR         |
| 9   | 10   | Mike Skube      | ART Agitator              | t     | Novak MXc | JR         |
| 10  | 4    | Fernando Belair | Associated 10L            |       | Novak MXc | Airtronics |





**Trinity's Kevin Maurer preps Joel Johnson's motor before the Invitational race.**



**The Grand Prize winner of the open drawing was this happy lad, Andy Carlson of Ontario, Canada. On his right is Kevin Maurer and on his left, Joel Johnson. He has a lot to be happy about!**

◆ **Invitational Class.** The opening lap was a "hammer-fest" that allowed only Johnson to get away cleanly, followed by Phillips and Mike Skube. This was about the last we saw of Joel, as he punched the afterburners and disappeared.



**Above: the 45-ounce rule applied to all cars, and this car, which belongs to Tyree Phillips, shows the evidence. It was \$2.50 underweight.**

Phillips was unable to gain anything on the Magic Man, and he then found himself with Jay Halsey on his tail. Halsey kept up the heat on him, and it stayed that way until the end. Joel took the win by 5 seconds over Phillips, and Halsey finished less than a second later in 3rd.

This was a great weekend for the "mortal" racers—the fairest race I've ever seen. Skill was everything in this one. Trinity and Speedworks really laid the foundation for things to come in this style of competition. If you ever have the chance to participate in one of these races, do it! ■



| BATTERIES | CHARGER      | BODY              | TIRES (F/R)        |
|-----------|--------------|-------------------|--------------------|
| .....h    | Tekin        | Andy's Lotec      | TRC green          |
| .....a    | Victor HI-IQ | Associated Jaguar | PSE green          |
| .....n    | Class        | Andy's Nissan     | PSE green          |
| .....d    | Victor HI-IQ | Andy's Porsche    | Twinn-K blue/black |
| .....-    | Victor HI-IQ | Associated Nissan | CKW green          |
| .....o    | Tekin        | Bud's NPT         | Associated green   |
| .....u    | Novak Peak   | BBR Lotec         | TRC green          |
| .....t    | Tekin        | Andy's Nissan     | TRC green          |
| .....t    | Tekin        | Bud's NPT         | TRC green          |
| .....t    | Class        | Associated Jaguar | PSE green          |

## SPORTSMAN CUP RACE RESULTS

| BATTERIES | CHARGER          | BODY          | TIRES(F/R) | SPONSORS                                                                             |
|-----------|------------------|---------------|------------|--------------------------------------------------------------------------------------|
| .....h    | Turbo thirty     | Andy's Nissan | TRC green  | Trinity, TRC, Novak, Team Losi                                                       |
| .....a    | Novak Digi-Peak+ | Andy's Nissan | TRC green  | Novak, Trinity, Associated, TRC, Du-Mor, Tecnacraft, Team Losi                       |
| .....n    | Novak            | Nissan        | Jaco green | Team Losi, Trinity, Ranch Pit Shop, Novak, Jammin', Jaco Products                    |
| .....d    | Novak            | Bolink        | TRC green  | Composite Craft, TRC, Trinity, Novak, Futaba                                         |
| .....-    | Novak            | Andy's Nissan | TRC green  | CAM, Novak, TRC, Andy's, Bud's, Arlington Hobbies, HPI, Star Force                   |
| .....o    | Novak Digi-Peak  | Andy's Nissan | TRC green  | Team Losi, Trinity, Novak, Oakley, JR, Tecnacraft, Dirt Bagz, Brigitte & Travis      |
| .....u    | Novak Digi-Peak  | Andy's Nissan | TRC green  | Team Losi, Trinity, Novak, JR, Andy's, HPI, Oakley, Brigitte, Kevin-Kevin Motor Prep |
| .....t    | Class AC Peak    | Andy's Nissan | PK green   | Team Class, Trinity, Novak, Du-Mor, Team Losi                                        |
| .....t    | Victor HI-IQ     | Andy's Lotec  | CKW green  | ART, Extreme Motor Sports, CKW Tires, Team Kamakazee, B-Sly Racing                   |
| .....t    | Novak Digi-Peak  | Andy's Nissan | TRC green  | Associated, Reedy, Novak, TRC, Max-Cell, Kimbrough, Du-Mor, Paragon, Andy's          |



# SCOPING OUT

## FUTABA'S MC 210CB

by JOHN RIST

**F**UTABA IS A giant in the R/C car industry. For proof of this, go to any R/C race and check out the transmitter impound: 80 to 90 percent of the transmitters are Futabas. With this in mind, I was excited to have the opportunity to check out Futaba's newest electronic speed controller—the MC210CB. If you drive a backyard burner that still has a mechanical speed controller, you're aware of the problems they cause. Out of

- bullet-style motor
- Futaba J-style receiver

The kit also includes a screwdriver and an instruction sheet.

The MC210CB's case snaps together (no screws). Sometimes it's difficult to get this type of case apart, but with some gentle prying of the locking tabs with a jewelers' screwdriver, I opened it. The fuse is almost recessed below the top of the case, and the socket had a very firm grip on it, so it was difficult to remove. I used needle-nose pliers to extract it. The

MC210CB's workmanship is first class. The solder joints look good and all of the parts are securely mounted. The 1/2-inch-square rubber pad in the bottom of the case that applies pressure

to the bottom of the printed-circuit board when the case halves are snapped together is a nice touch. I suspect that this pad provides a little cushioning for the controller's components in the event of a hard landing. Looks are great, but current-handling capability is what it's about, so I headed for the "Scoping Out" lab.

### VOLTAGE-DROP TESTS

Low "on" resistance is so important because high resistance robs power and generates heat. With the 12 amps of current, the voltage drop along the length of the wires was 0.33 volt, which yields a resistance of 0.0275 ohm. Two inches along the wires, the voltage drop was 0.27 volt—a resistance of 0.0225 ohm.

Although they're too high for a racing speed controller, these voltage-drop figures are pretty good for a reversing speed controller. (I've seen them with voltage drops of 0.5 volt!) Reversing speed controllers such as the MC210CB have a higher "on" resistance than forward-only

controllers because the FETs are split into four groups. Two groups are used for forward and two are used for reverse; a forward-only controller places all of the FETs in one super-low-resistance group. But reversing speed controllers aren't meant for racing. They're primarily intended for backyard fun, fun, fun.

### LET-IT-COOK TEST

I jacked the current up to 20 amps and let the controller run wide open. The MC210CB has a built-in heat sink that I left in place, but I didn't provide any cooling air. After 10 minutes, the controller's heat sink was too hot to touch, but the MC210CB was still operating normally. Considering their higher on-resistance, you have to expect reversing speed controllers to heat up, but what counts is that the MC210CB didn't go belly-up. With standard gearing for a backyard burner (a ratio that yields about 5 to 8 minutes of run time) and adequate cooling air, the MC210CB should hold up well.

### DEAD-SHORT TEST

I plugged in a freshly charged 6-cell battery pack and clipped a piece of monster wire across the motor leads: poof!—dead. The built-in 30A fuse was blown and the current stopped flowing. I removed the short and replaced the fuse, and the MC210CB was up and running, having suffered no ill effects. I recommend that you buy some spare fuses and keep them in your tool kit. They're relatively inexpensive, and a spare fuse could save your day.

Speaking of fun, it was time to have some with the MC210CB and my Kyosho Sideways!

### CUTTING LOOSE IN THE LOT

I read the brief instruction sheet thoroughly. The only topic that it covers fully is how to adjust the MC210CB to your

(Continued on page 56)



the box, they're hard to install and adjust; it's a major task to get the servo travel to match the travel of the mechanical controller; and, on top of this, they run hot, tend to burn up and don't have very smooth throttle response. The MC210CB looked as if it might be a reasonably priced "fix" for all of these ills.

The MC210CB has the following features:

- full forward and reverse
- 10 FETs to handle the power (eight for forward, two for reverse)
- built-in heat sink
- built-in pots and pulse-checking LED for setting neutral and full throttle
- a full set of connectors installed
- Tamiya-style battery



## "SCOPING OUT" LAB AND TESTS

**THE LAB** consists of:

- an oscilloscope
- a digital voltmeter
- a variable-load resistor bank
- a 6V 30A electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5W power resistors that can be switched on and off one at a time to vary the load between 6 amps and 20 amps, but the standard 12 amps are usually used.

In series with the resistors is a 25A Simpson current meter and a 1-percent 0.01-ohm resistor. By measuring the voltage drop across this resistor, the current-meter's reading can be double-checked. Of course, the lab power supply provides the test current.

• **VOLTAGE-DROP TESTS.** These are the first tests. It's virtually impossible to read an ESC's resistance directly, so I measure the voltage drop across it with the resistor bank set up for 12 amps of current. I then calculate the controller's "on" resistance by dividing the measured voltage drop by 12 amps. I take the voltage reading twice: along the full length of the battery and motor wires (including connectors) and 2 inches along them. The first reading helps me to determine an ESC's "on" resistance as it comes from the factory, and the second gives a standard reading with which I compare ESCs.

• **LET-IT-COOK TEST.** I adjust the resistor bank to pass 20 amps of current, then I jam the throttle wide open and let the ESC pump the 20 amps.

• **DEAD-SHORT TEST.** With this test, I check whether the controller can survive the heavy current caused by a jammed gear or a fried motor. No one likes to have this kind of trouble and discover that his ESC has been destroyed, too.

## FUTABA MC210CB

### DIMENSIONS:

Height (with heat sink) ..... 1 inch  
Width ..... 1.6 inches  
Length ..... 1.8 inches  
Weight (with wires) ..... 2.8 ounces

### TUNING:

Access to controls ..... Good  
Ease of adjustment ..... Fair

### PRICE:

Suggested retail ..... \$79.95  
Warranty ..... 180 days

### ELECTRICAL:

(Manufacturer's specs)

Max voltage ..... 8.4 volts  
Min voltage ..... 7.2 volts

### COMMENTS:

The MC210CB is Futaba's latest addition to its line of reversing ESCs. It's intended to replace the pesky mechanical speed controllers that come in most backyard-burning buggies. The big news is that it has a built-in 30A fuse to protect it against burnout caused by "overgearing," shorts or burnt-out motors. Any of these problems is bad enough without losing an ESC in the process. The MC210CB has a fairly low "on" resistance for a reversing speed controller. It became quite warm in the let-it-cook test, but it only warmed a little in actual use. Brakes were a little wimpy, and reverse was slow, but it worked well enough to get the car out of trouble when it strayed nose-first into the curb. Forward performance was great. It had good acceleration and top end, and the trigger response was very smooth over the whole speed range. It comes with a complete set of connectors, so it's a snap to install.

Max current forward ..... 568 amps  
Continuous current forward ..... 142 amps  
Fuse current ..... 30 amps  
Resistance ..... 0.062 ohm x 2  
(0.0124 ohm total)

### TEST PARAMETERS:

Voltage ..... 6 volts  
Current ..... 12 amps

### TEST RESULTS:

Voltage drop along length of wire ..... 0.033 volt  
Voltage drop 2 inches along wire ..... 0.27 volt  
Resistance to end of wire\* ..... 0.0275 ohm  
Resistance 2 inches along wire\* ..... 0.0225 ohm  
\*voltage drop ÷ current = resistance

transmitter. There's no advice about how to install the MC210CB in the car. It does mention briefly that you must add motor capacitors, but it doesn't tell you how many or where to install them. I used a 3-capacitor setup: one between the brush hoods and one from each brush hood to the motor's case. A warning: don't use the large polarized-style capacitors (the type that has + or - marked on one end of the cap), because when you put the car into reverse, the reverse voltage might blow up the capacitor. Anyway, the instruction sheet *does* have a few good pictures that show you how to connect everything—enough to head most of you in the right direction. As always, there's no substitute for a hobby-shop owner to help you out when you get stuck.

Controller installed, batteries charged, the Sideways and I headed to the local parking lot to see how the MC210CB would behave. It didn't take long to realize that a good ESC is head and shoulders above a mechanical speed controller. The top speed was good, and acceleration was brisk.

I thought that the brakes were a little wimpy; they were strong enough to stop the car in a reasonable distance, but they just weren't strong enough to induce a good slide when I tried for a screaming 180-degree, slide-and-go turn. To soften

the gear-busting jar the car takes when you jam it from forward to reverse, Futaba has programmed about a 1-second delay.

The only other feature that I found to be a little limp was reverse. The car backed up slowly, even with the trigger in full reverse. It's no biggie, because reverse is only used for backing up when you're stuck against a curb, or a tree, or whatever is in the way. Besides, the MC210CB screamed in forward, which is where the fun is.

Because it had heated up in the lab, I checked the MC210CB after each run and found it only a little warm. If you give it a little cooling air, it should work very well in most stock-motor setups.

The MC210CB seems to be a good choice for anyone who needs to replace a mechanical speed controller. It probably weighs a little less than a mechanical speed controller, it's a lot easier to install and set up, and it "drives" a lot more smoothly. Some tracks allow the use of reversing speed controllers. The MC210CB handled my stock motor quite well and probably would be OK for off-road racing. Just remember, reversing speed controllers are most suitable for backyard burners.

\*Here is the address of the company that's featured in this article:  
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

C & M TEAM

by JIM SHEPKA

# Cobra LTOOR



PHOTOS BY JIM SHEPKA

**I**'VE been a diehard  $\frac{1}{10}$ -scaler for as long as I've been involved with R/C. With the advent of larger banked tracks and specialized oval equipment, however, I found myself gravitating to the left-turn-only (LTO) crowd. After running myself dizzy as I tried to keep up with the ever-increasing pace and cost of  $\frac{1}{10}$ -scale oval racing, I thought it was time to rethink my R/C strategy.

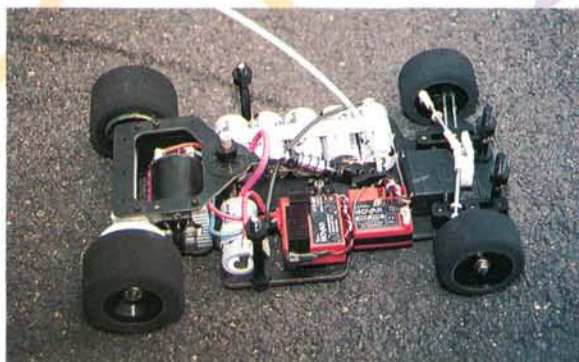
I desperately wanted to get back into roadcourse racing, so I recently took the plunge into the world of  $\frac{1}{12}$ -scale miniature missiles. Having zero experience in this form of racing, I decided on a vehicle that would suit my "oval" experience and my desire to be a roadcourse racer: the new Cobra LTOOR from C&M\*.

I won't bore you with the sordid details of assembly, etc.; I'll take a different approach and point out what's new about the Cobra's design.

Most obvious among the new features is the versatile

chassis plate, which was designed to accommodate five cells on the left and three on the right. (Oval racers obviously want to bias their cars' weight to the left, but I planned to modify the Cobra for roadcourse racing.) And you can run the same powerplants in these cars as you do in  $\frac{1}{12}$ -scalers.

I had to adjust my driving style considerably to move from 4-minute,  $\frac{1}{10}$ -scale, oval races to 8-minute  $\frac{1}{12}$ -scale ones. The four-finger death grip on the transmitter was no longer a viable approach. (I guess I'll have to show a little more respect for all you  $\frac{1}{8}$ - and  $\frac{1}{4}$ -scale racers! I always wondered why you all looked so dazed after a race!)



1 / 1 2 - s c a l e v e n o m !



## SPECIFICATIONS

Manufacturer .....C&M/Team Cobra  
Type .....Oval/on-road  
Scale .....1/12  
Suggested Retail .....\$215.95

### DIMENSIONS:

Overall length .....9.75 inches  
Width .....6.625 inches  
Wheelbase .....7.75 inches  
Front track .....5.375 inches  
Rear track .....5.125 inches

### WEIGHT:

Gross (with battery) .....33.14 ounces

### BODY:

Type .....Protoform GTP\*  
Material .....Polycarbonate

### CHASSIS:

Type .....Pan  
Material .....Graphite

### DRIVE TRAIN:

Primary .....Pinion/spur  
Transmission .....Direct drive  
Differential .....Ball  
Bearings/Bushings .....Ball bearings

### SUSPENSION:

Front: Type .....Floating kingpin  
Damping .....Coil spring  
Rear: Type .....T-plate  
Damping .....Oil-filled, coil-over shock

### WHEELS

Front: Type .....One-piece plastic  
Dimensions .....1.3x1.5 inches  
Rear: Type .....One piece plastic  
Dimensions .....1.3x1 inches

### TIRES:

Front .....Left: blue; right: orange/blue  
Rear .....Green

### ELECTRICS:

Motor .....Not included  
Battery .....Not included  
Speed controller .....Not included

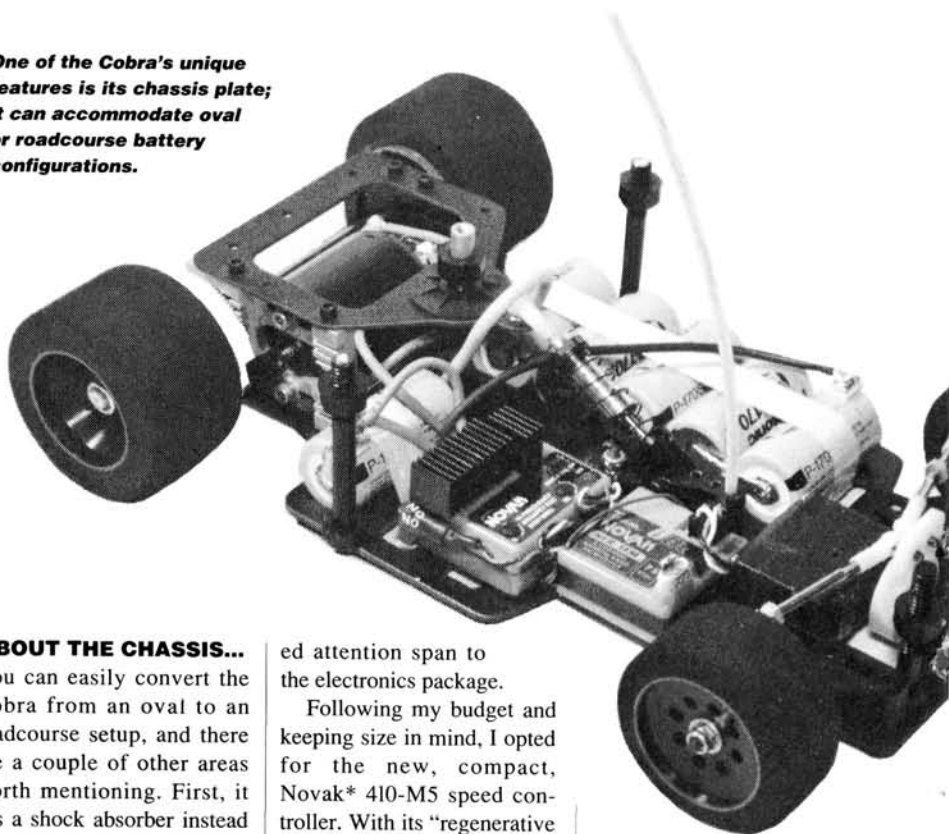
### OPTIONS:

Novak NER-3FM (75MHZ) Receiver and 410-M5 electronic speed controller; Trinity P-170 6-cell pack; TRC\* ZR-I racing wheels; Futaba S-132H servo; Reedy Modified Mr. A motor; Robinson Racing\* Silencer Series spur-and-pinion gears; Protoform Intrepid GTP body; Kimbrough\* large servo-saver.

### COMMENTS:

The Cobra LTOOR is easy to set up and work with, and it promises to be a real force in the hands of oval racers. You have to appreciate the design's simplicity and the extras included in the kit. This is a high-quality car that can put you in the winners' circle.

**One of the Cobra's unique features is its chassis plate; it can accommodate oval or roadcourse battery configurations.**



### ABOUT THE CHASSIS...

You can easily convert the Cobra from an oval to an roadcourse setup, and there are a couple of other areas worth mentioning. First, it has a shock absorber instead of the old-style piano-wire-and-spring setup. (Welcome to the '90s! Now, if someone would only come out with a true gas-pressure shock!) For oval racing, you could add your own rear swaybar if you think you need one, but it's not a requirement.

I like the Cobra's wide rear pod because it's easy to work on. I also appreciate that the high-quality titanium steering rods are included with the stock kit. A slight departure from the norm is the inclusion of a titanium rear axle. Oval racers like to see it, but I'm not too sure of its application for roadcourses. It may cause too much of the "flywheel" effect to be used proficiently, but I'll let my testing do the talking. C&M also include threaded front axles—not those dreadful E-clip-type axles that are so common. The little things really make a difference.

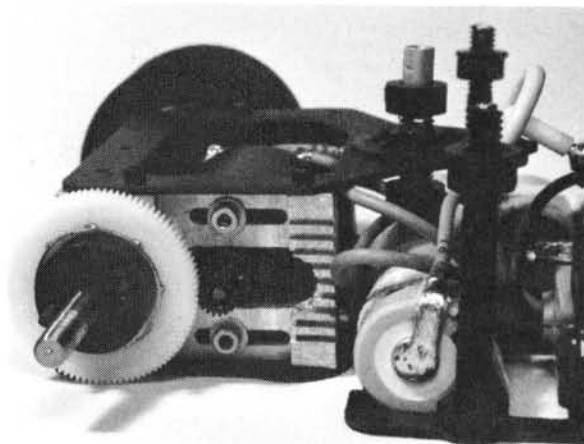
Having completed the chassis (see? I said there would be no blow-by-blow account!), I turned my limit-

ed attention span to the electronics package.

Following my budget and keeping size in mind, I opted for the new, compact, Novak\* 410-M5 speed controller. With its "regenerative circuitry" and low resistance, it fits the chemistry of this package. Intelligence is provided by a Novak NER-3FM receiver and a Futaba\* S-132H steering servo, and

### TEST

I packed up my gear and headed to Mike's Speedway in Hadley, MA, in search of the gold. I had run a number of tests there, so I knew what

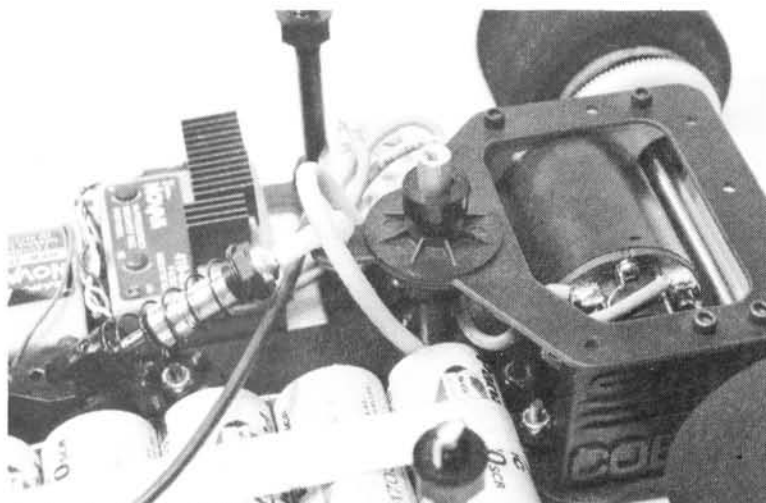


**High-quality parts abound in the LTOOR. The inclusion of a titanium rear axle is a departure from the norm. Some racers like them, some don't.**

the powerplant is a Reedy\* modified, Mr. A, 14 triple. I planned to run the Cobra as an oval car, and I mounted all the electronics, etc., with this in mind.

I needed to go fast on this oval track.

After a couple of warm-up laps to check out trim rates, throttle control and body height, I reeled in the anchor and went for it. The Cobra



Instead of the old "piano wire and spring" arrangement, the LTOOR uses a more current setup: a miniature, pressurized shock.

snap-rolled going into the first turn, so I decided that a tire change was in order. I went to the tire machine, trued-up an orange/blue foam tire and mounted it on the right front. I also checked tweak and peaked the pack and then went back to testing. One of the really neat things about using Trinity\* matched Panasonic P-170s cells is that you don't have to take them out after every run. Just let them cool and then recharge them. They really make practice sessions painless.

Back on the track, I had to concentrate a lot more than I have in the past. The speeds achieved by these smaller cars are great, but I also real-

ized that no paint is bright enough! (Thanks to Vinnie Bradway for the great Chevy Intrepid paint scheme!) These cars can get lost when a lot of cars are on the track.

I was quite impressed with the Cobra's torque and cornering speeds. Compared

**This solidly constructed Cobra LTOOR is a serious threat on the 1/12-scale-oval scene. With its offset chassis plate and titanium axle, I'm confident that it will have an impact.**

with most of the other cars, which were loaded with "split-pack sets" of cells (three/three), I had a decided edge in the tight turns (five cells on one side; one on the other). Being able to hold a tighter line means running a

shorter distance and, therefore, running faster laps.

### IMPRESSIONS

This solidly constructed Cobra LTOOR is a serious threat on the 1/12-scale-oval scene. With its offset chassis plate and titanium axle, I'm

confident that it will have an impact. It should also prove to be competitive on the roadcourse circuit, although

there are already a number of highly specialized cars on the market for that...but then again, if it were easy, everyone would be doing it!

\*Here are the addresses of the companies mentioned in this article:

C&M Mfg., P.O. Box 701-353, West Valley City, UT 84170.

Novak Electronics Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

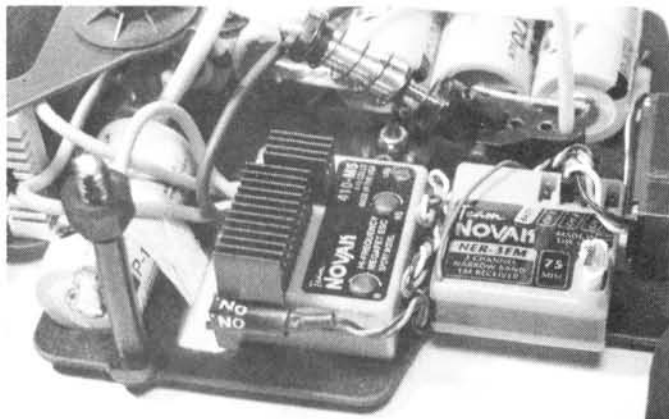
Reedy; distributed by Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Trinity Products Inc., 1901 E. Linden Ave., #8, Linden, NJ 07036.

TRC, 2211 Charter St., P.O. Box 1058, Albemarle, NC 28001.

Robinson Racing Products, 165 N. Malena Dr., Orange, CA 92669.

Kimbrough Products, 1420 East St. Andrews Place/Unit F, Santa Ana, CA 92705. ■



Novak running gear complements the Cobra chassis. The 410-M5 ESC channels battery power to the motor, and the NER-3FM receiver filters out radio interference.



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by MIKE OGLE

**C**HANCES ARE, the first time you operated anything radio-controlled it was with a twin-stick radio. The twin-stick design is an industry standard for R/C airplanes and boats, and although it predates the more familiar "wheel" radios that most racers use, several notable R/C car racers—Andy Dobson and Masami Hirosaka, for example—still find stick radios to their liking.

If you're like most racers, however, you might be considering a stick radio because they're very economically priced. If you just broke the bank buying your new Team-Stealth-Turbo X-15 and you still need radio gear, take a look at the new Futaba\* Attack III. This good-looking outfit comes with a 2-channel receiver, two standard-size servos, some new bells and whistles just to keep things interesting and, best of all, a price tag of around \$50!

The Futaba Attack III shows that stick-radio design has progressed since I last used one. This small, ergonomically designed transmitter not only looks good, but it also really feels good in my hands. The lightweight gray case is contoured for hours of comfortable operation, with every control at your fingertips...well, actually, at your thumbtips. Younger racers with small hands should find the Attack especially easy to handle. The Attack uses eight AA batteries, and directions for installing them correctly are molded into the case.

When you switch on the power, the Attack III springs to life with a double beep and five bright LEDs that keep you informed of the batteries' remaining capacity. As the transmitter batteries weaken, the LEDs (three green, one orange and one red) will gradually go out, right to left, until the power is low enough to trigger an audible alarm and a flashing red LED. This is your signal to bring your car in before you lose



*If you're looking for one of the best radio bargains around, the newly designed Futaba Attack III is worth serious consideration. This ergonomically designed, two-stick system has five LEDs that monitor battery capacity.*

# F U T A B A ATTACK III

radio control, and load up the Attack III with new batteries. Although rechargeable Ni-Cds will work well, you'll have to remove them to recharge them, because the radio doesn't have a built-in charging jack.

You can adjust the throttle stick for more forward "throw"—a small modification that you can make with just a screwdriver (the instructions tell you how). This will give you twice as much forward movement as reverse, and, therefore, a finer degree of throttle control.

Included in the Attack III outfit is the FP-R112JE, a small, AM, 75-band receiver that's just slightly larger than the 1024 PCM. This new, narrow-band receiver complies with the FCC's 1991 regulations; in other words, it handles the new odd-numbered fre-



**The Attack III includes two powerful S148 servos and Futaba's compact, narrow-band FP-R112JE receiver with BEC.**

quencies. (As always, check with your local track's rules before you use these odd-numbered frequencies!)

For airplane enthusiasts, the FP-R112JE is

*(Continued on page 66)*

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## FUTABA ATTACK

(Continued from page 64)

also available on 72-band frequencies. The transmitter and receiver crystals included in the unit I received were ceramic channel 84s, and they were clearly marked. And, of course, the receiver includes a battery eliminator circuit (BEC) that supplies the power to your servos.

The two servos included in the Attack III are Futaba S-148s—standard-size servos that have enough torque for most applications, and an operating speed of .22 second/60 degrees. If you have a car with a mechanical speed controller, one servo will operate it, and the other one will be used for steering. If you choose an electronic speed controller, you'll have a spare steering servo. Bonus!

Also included are frequency flags for installation at the top of your antenna. Throw them away immediately! A frequency flag immediately signifies a rookie on the drivers' stand. Make no mistake, these are a hallmark of geekdom!

Just for the challenge of it, and because the radio looked so cool, I couldn't resist trying the Attack III for a few packs with my JRX-Pro. Although I was awkward at

(Continued on page 68)

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## FUTABA ATTACK

(Continued from page 66)

first with the twin-stick setup, I was surprised at how quickly I got the hang of it. Although it was a while before I was comfortable enough to try the Attack III in competition, it wasn't long before I was buzzing around in the local parking lot. Whether you're a novice looking for one of the best radio bargains in R/C, or a newly converted R/C airplane enthusiast, you can't go wrong with this high-quality, low-cost unit from Futaba.

\*Here's the address of the company featured in this article:  
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718. ■

## LETTERS

(Continued from page 9)

Jason, to convert your existing RC10 into a Team Car, here are the items you'll need and their retail prices:

- Stealth transmission: \$120
- Team shocks: front \$28/pair; rear \$30/pair
- longer front A-arms: \$6/pair
- rear hub carriers: \$4.50/pair
- in-line steering blocks/in-line axles: \$7/pair
- new bulkhead: \$4

You don't necessarily need a new chassis. The conversion parts total \$199.50; the retail price of a new Team car is \$305, but your local hobby shop will probably charge less. The choice is yours. And thanks for your suggestion—we plan to include track diagrams whenever possible in future race coverage. JH

## THANK YOU

I want to use your "Letters" column to give a big thank you to the companies that supported drivers by providing door prizes and banners for the 5th Annual Vintiques R/C Car Race on August 1, 1992. Without them, we wouldn't have had as much fun! Even though we're just "weekend warriors," Bolink, Litespeed, Pro-line, MIP and Paragon helped us out! I want all these companies, AJ's Hobbies and the Vintiques Car Club to know that we appreciate what they did for us. The race track was provided by AJ's Hobbies, and the Vintiques Hot Rod Club paid for space for us to set it up. Thanks again!

RAY BAKER  
Kirkland, WA

## TRICK TRAXXAS

I look forward to reading your mag every month—totally awesome! I have a problem

though: I'm a proud owner of a Traxxas Sledgehammer with HPI rims, a standard ESC and a standard 540 motor. How can my truck be competitive? I've thought about buying motors and batteries, but since Traxxas doesn't offer any hop-up parts, what am I to do? Thanks!

DAROLL R. BELL  
Riverdale, MD

Actually, Daroll, Traxxas does offer hop-ups for the Sledgehammer. The Blue Eagle LS upgrade kit (part no. 1930) includes parts that can be used to make your Sledgehammer run better. The kit comes with extra-long rear suspension arms, extra-long drive shafts, turnbuckles and four light, 2.2-inch, deep-dish wheels (recommended price: \$25). To use the kit's offset front rims, you'll need new front-suspension arms (part no. 1931; \$8).

New shocks wouldn't hurt either. Traxxas offers both standard and hard-anodized shocks in regular length and extra-long. Prices range from \$25 a pair for the standard shocks to \$30 a pair for the hard-anodized shocks.

Though you can't use the Blue Eagle LS tranny in your Sledgehammer, you can upgrade your existing one. Install a 48-pitch ball-diff setup (part no. 4620; \$50) and the

(Continued on page 74)

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## LETTERS

(Continued from page 68)

Traxxas 48-pitch brass drive gear (no. 1783, \$3) in place of the car's original 32-pitch planetary gear, and you'll have a tranny that operates much more smoothly. Robinson Racing offers a 48-pitch conversion kit for the Sledgehammer, too, and Thorp also makes accessories for it.

After that, you could buy a high-quality speed controller and batteries. Then hit the track at full speed ahead! JH

## BACK TO BASICS

I have a few questions. I'm a beginner, and I'm just going to drive for fun at first, but later, I might get into racing at my local track. Is the

Junior T a good beginners' truck? If it is, can I upgrade it with the LX-T's parts?, e.g., the Hydra Drive, new tranny, etc. Is the Airtronics Contender ESC with reverse good? If it isn't, could you tell me which good ESCs have reverse and cost less than \$100? Is the Futaba Magnum Sport a good transmitter for my backyard and the track? Or should I get a Magnum Jr. or an Airtronics XL2P? Thanks for your help. I think your mag is great.

NICK FOSTER  
New Whiteland, IN

The Junior T is an excellent choice for a beginner, and all the Losi parts are interchangeable, so you'll be able to upgrade it. And yes, Nick, you'll also be able to add the Hydra Drive to the Junior T, but it already has the

same transmission as its big brother, the LX-T. There's no "new" transmission. Losi puts the same tranny in all its kits.

The Airtronics ESC you mentioned is a good choice, but if you plan to race, go for a racing ESC. Most tracks don't allow the use of reverse, but if you're intent on getting an ESC with reverse, Novak and Tekin make excellent ones.

As for your radio dilemma, the Magnum Sport is a fine model, but if you want to get serious about racing, think about investing in one of the more sophisticated AM or FM systems; they're definitely worth the money! Good luck with your choices. JH

(Continued on page 108)

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# WCM GRAND NATIONAL

by FRANK MASI

**E**VEN WHEN THEY see super-fast  $1/10$ -scale electric race cars, most people who aren't involved in our wonderful hobby still dismiss it as "playing with toys." One-eighth-scale gas cars fare a little better: "Wow, those are pretty big." Fire 'em up, and most people within earshot will investigate further: "I've never seen anything like that before." Still, if you want to be taken seriously—*very* seriously—just show them the biggest guns in the R/C armament—the  $1/4$ -scale cars.

There are many different types of  $1/4$ -scale car (sprint, outlaw stocker and Indy, to name a few), but the most popular seem to be Grand National stock cars—spittin' images of their full-size, NASCAR counterparts.

WCM\*, a company that's familiar to  $1/4$ -scale devotees as the premier manufacturer of "big iron," has recently introduced one of the most exciting  $1/4$ -scale cars I've ever seen. The Pro Belt Grand National is a

fully assembled, belt-driven stocker that looks ready to go on any paved track you see fit to unleash it on!

**You'd really have to try to damage the Grand National's chassis.**

## BIG SCALE FEATURES

The first thing I noticed about the WCM Grand National was its trick chassis, which is made of  $1/2$ -inch-diameter steel tube that's welded for strength. The chassis extends from the unbreakable, Delrin, front bumper, past the engine and fuel-tank bay (which it completely surrounds for added protection) to

just aft of the rear axle, where it's connected to another durable Delrin bumper. You'd really have to *try* to damage the Grand National's chassis. It looks beefier than Delta Burke at an all-night pig roast!

Quarter-scale cars are generally more expensive because of their many metal parts and detailed machine work. The Grand National is no exception: its beautifully crafted, aluminum front suspension screams "High price!" but the Grand National is one of the least expensive ways to "go quarter."

Double wishbones with adjustable camber are mated to an aluminum crosspiece that doubles as a mounting place for the two steering servos and connects the front suspension

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components to the main chassis. A pair of aluminum, oil-filled shocks provides damping for the race-ready front suspension. These shocks, which have durable steel shafts and special, screw-in seals that won't leak, are mounted on aluminum plates that you bolt to the front suspension's crosspiece. By mounting the shocks in the different holes, you can adjust the damping.

Big cars require big steering setups. The Grand National comes with WCM's unique, sliding, rack-steering system, which uses *two* servos! The servos are attached to a common "rack" and wired to work together off one radio channel to provide twice the torque of a single servo.

A large-diameter, fully adjustable anti-roll sway bar is also part of the Grand National package. Sway bars are designed to curtail chassis roll during cornering by increasing tire adhesion. This improves the car's handling.

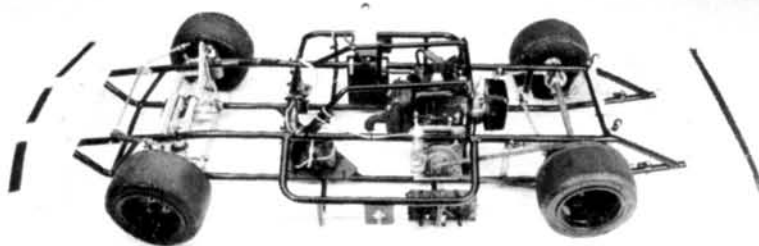
A Watts-link rear suspension system keeps the Grand National's rear planted firmly on the track. A solid rear axle is held in place by two free-floating carriers that are attached to the chassis by adjustable trailing links. The height of the links' forward mounting point can be varied to change the rear axle's trailing radius. This affects how the car reacts to acceleration and braking, as well as the manner in which the suspension absorbs surface irregularities. Extra support for the rear axle is provided by another set of links that are attached to the underside of the axle carriers and extend back to the main chassis. Also, lateral axle movement is kept in check by a cross-brace that runs between the left axle carrier and a chassis cross-member.

As in the front, damping is provided by a pair of fully adjustable aluminum shocks that are attached to an aluminum mount.

#### QUARTER POUNDER

A neat feature of 1/4-scale cars such as the Grand National is that they don't use hyper-sensitive nitro-burning engines like their 1/8-scale siblings. They're powered by common "chain-saw" engines that have simple fuel requirements.

A vertically mounted 23cc Zenoah engine is nestled in a protective "cage"



**The Grand National's "cage" frame is made of 1/2-inch-diameter tubular steel. Heavy-duty front and rear Delrin bumpers ward off potential hackers.**

## WCM GRAND NATIONAL

in the chassis. This engine runs on gas that has been mixed with a lubricant to minimize the wear of vital components. A rugged pull-

start mechanism protrudes from the engine's right side, and it can be reached through the window cut-out when the body is mounted.

Power is transferred to the Grand National's belt-drive system through a 26-gram centrifugal clutch. This allows the engine to "spool-up" a little before it engages so that it can idle without the

### SPECIFICATIONS

Manufacturer .....WCM  
Type .....On-road  
Scale .....1/4  
Price .....\$795

**DIMENSIONS:**  
Overall length .....48 inches  
Width .....18 inches  
Wheelbase .....26 inches  
Front track .....17 inches  
Rear track .....16 inches

**WEIGHT:**  
Gross (with battery) .....30 pounds

**BODY:**  
Type .....Chevy  
Material .....ABS

**CHASSIS:**  
Type ..... "Cage"  
Material .....Steel

**DRIVE TRAIN:**  
Primary .....Gilmer belt drive  
Transmission .....None  
Differential(s) .....Ball (optional)  
Bearings/bushings .....Ball bearings

**SUSPENSION:**  
Front: Type .....Independent, fully adjustable  
Damping .....WCM shocks with screw-in seal packs  
Rear: Type .....Watts link  
Damping .....WCM shocks with screw-in seal packs

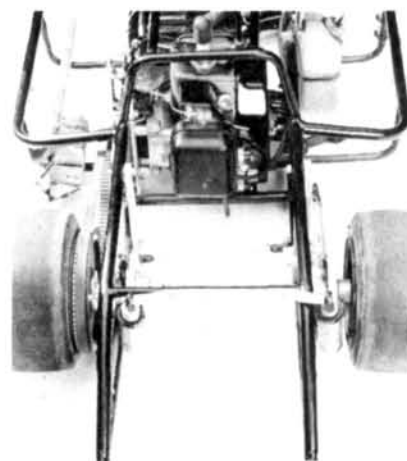
**WHEELS:**  
Front: Type .....Three-piece plastic  
Dimensions (DxW) .....3.75x2 inches  
Rear: Type .....Three-piece plastic  
Dimensions (DxW) .....3.75x3 inches

**TIRES:**  
Front/rear .....Rubber with racing caps

**POWER:**  
Engine .....23cc Zenoah gas engine

**OPTIONS AS TESTED:**  
Futaba radio system, ball diff

**COMMENTS:**  
If you've been itching to get into 1/4-scale, look no further than WCM's Grand National stocker. For a relatively low price, you get a well-made rolling chassis with an engine, complete with a fuel tank. Although it isn't as quick as an 1/8-scale car, the Grand National's size and appearance made it a blast to run. It handles well, stops easily and has a pretty impressive top speed. Quarter-scale technology is on the fast track, so the cars are getting better and the prices are getting lower. Now's the time to check 'em out.



**The Grand National has a solid, trailing-axle rear suspension. Damping is provided by a pair of oil-filled, coil-over shocks.**

risk of stalling. A precision disk brake is actuated by an eccentric camshaft that's connected to the huge Futaba\* servo that also works the engine's throttle linkage.

The car that I tested was equipped with WCM's optional ball diff. If you're familiar with the common ball diffs used in 1/10-scale pan cars, you'll have no trouble spotting the large diff pulley that's sandwiched between the Grand National's axle carrier and its outer wheel hub.

As with most other forms of R/C, 1/4-scale technology hasn't been standing still. Gone are the once-common, semi-pneumatic tires of yesterday that gave minimal traction. The Grand National comes with a full set of capped rubber racing tires—just like the ones 1/10-scale superspeedway racers use on their pan



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## WCM GRAND NATIONAL

cars! These tires provide plenty of grip on asphalt surfaces, and they last quite a long time so owners don't have to worry about replacing them every week.

With the basic Grand National chassis, a large fuel tank with a quick-fill valve and an ABS Chevy NASCAR body are included. The quick-fill fitting is attached to the main chassis so that lightning-fast pit stop "gas-ups" can be done easily through the body's window cut-out.

The body itself is, well, huge! I mean, it weighs more than an entire 1/10-scale car. Quick-release fasteners on the sides and Velcro® strips on the front and rear bumpers

hold the body on the chassis securely. Since it's ABS, paint it on the outside, not on the inside as you would a Lexan body.

### DRAWN AND QUARTERED

To road-test the WCM Grand National, we took it to the biggest, most open site we could think of: a brand-new freeway that's still under construction and not yet open to the public! With the vast space that was available to us, we were sure that we could explore the limits of the Grand National's performance.

The first thing I noticed was that this car had been geared for all-out speed! Takeoffs were slow, but when things got rolling, the engine came on with a whoosh of power, and the car shot off. I couldn't believe how stable this car was at speed; at full bore, I could flick the front steering wheel back and forth and the stocker would follow, swaying wildly from side to side.

Despite its largeness, the car cornered very well, and the dual-servo steering system never once faltered. With full steering travel dialed-in from the transmitter, the Grand National cornered in an 8- to 10-foot radius. I imagined this chassis with a low-slung GTP body on it, tackling a tight roadcourse. Who knows?

For the ultimate test, I hopped into the passenger seat of the *Car Action* mobile photo Explorer with transmitter in hand and drove the GN down the highway at full clip! John Huber punched the Explorer off the line in hot pursuit, and we caught up to the 1/4-scale car at about 45mph! With even taller gearing, I bet the GN could easily hit 55 or 60mph.

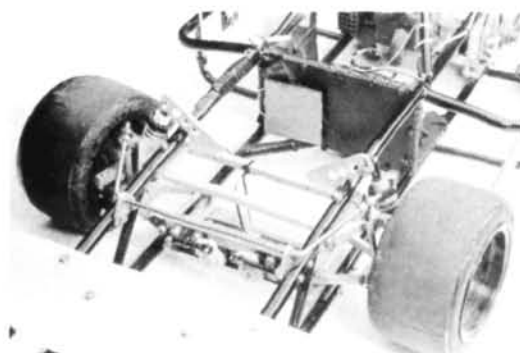
Want a change? Try 1/4 scale. For a surprisingly low price for a 1/4-scale car—\$795—you get everything except the radio gear and fuel. The Zenoah engine may not be a rocket, but it starts easily and provides tankful after tankful of running enjoyment. It's interesting that this car ran longer on the same amount of fuel than my 1/8-scale car does.

Overall, the WCM Grand National offers a lot for the money. Its "cage" frame and machined suspension parts look and perform like much costlier pieces, and its bulletproof driveline will provide hours of racing fun. So what are you waiting for? Take the big-scale plunge!

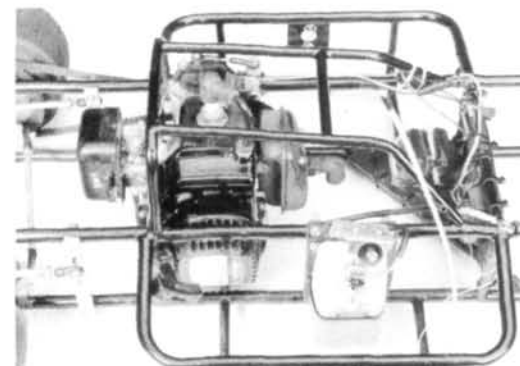
*\*Here are the addresses of the companies mentioned in this article:*

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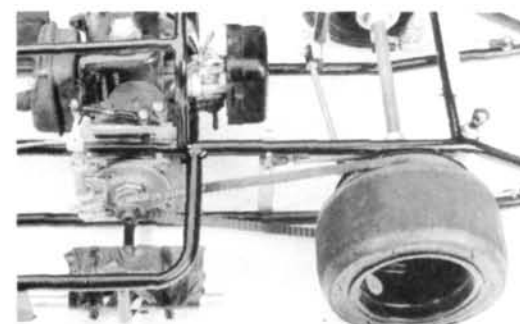
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The upper and lower double-wishbone front suspension arms are machined aluminum. The upper arms are adjustable so camber may be varied.



The Grand National comes with a 23cc Zenoah engine installed. The fuel tank with quick-fill fitting is also attached to the main frame.



A cogged belt transmits the engine's power to the optional ball diff. Stopping power is provided by the precise disk-brake setup.

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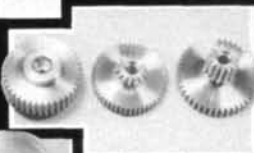
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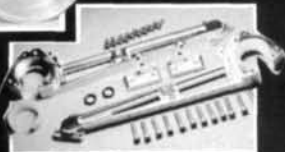
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## TEAM LOSI

### TECH TALK

#### • Updated parts

Team Losi has recently updated three parts: the rear hub (A-2038) and the rear bulkhead (A-2001) each have a camber-link hole not found on previous versions, and the LX-T's front shock tower (A-1015) camber-link holes have been changed slightly and one has been added.

#### • About these changes

These parts were modified with the LX-T in mind. The new camber-link holes in the rear hub and the rear bulkhead help to increase traction and rear-end stability; most of our team drivers use them. (Note: this camber link location on the LX-T requires a 2 1/4-inch turnbuckle.) These parts may also be used on the Pro-SE. (Note: this camber link location on the Pro-SE requires a 2-inch turnbuckle.) If you use them on the SE, you may notice that its rear end bounces a little more on certain tracks. If this happens, use the stock camber locations.

The LX-T front shock tower has been modified to improve steering response. There are now four holes for the camber link. Most of our team racers use the second from the outside. The farthest inside hole will increase steering response, but may make it too responsive.

#### • Bump-steer

When you build your Pro-SE, you may notice a slight amount of bump-steer. To correct it, place two no. 4 (gold) washers under the ball stud on each spindle.

#### • Dogbones vs sliders

We're always asked, "Which are better, dogbones or sliders?" The fact of the matter is, neither is better; they're just different. Sliders tend to handle bumps better than dogbones, but dogbones allow faster acceleration and better steering than sliders. Basically, choosing dogbones or sliders is another adjustment that you can use to dial-in your car or truck.

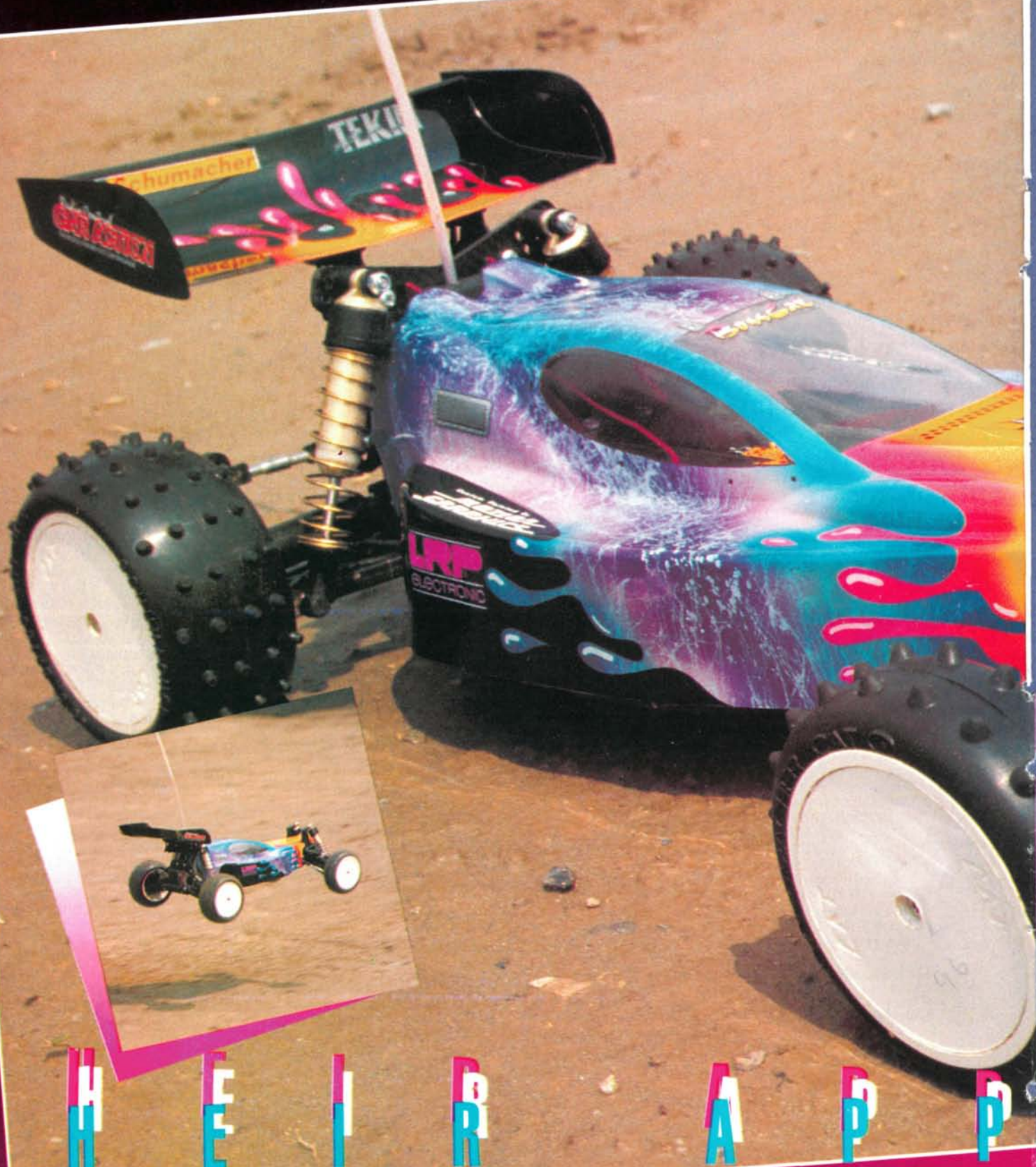
Let us know what's going on! Address your question and problems to Team Losi, "Tech Talk," 13848 Magnolia Ave., Dept. J, Chino, CA 91710.



## TRACK REPORT

**T**HE NAME SCHUMACHER\* is synonymous with high-performance 4WD buggies. From the Cat XL and the Cat XLS (an IFMAR World Champion) to the Pro Cat, Schumacher's impressive heritage extends to the beginning of the 4WD class.

As time moves on, so do car designs. The Pro Cat needed an overhaul, so the people at Schumacher set out to equip it



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with all the latest goodies. Along the way, however, they changed the Pro Cat's basic design, too—thus, the BossCat.

#### CAT CHANGES: FROM NOSE...

Until the BossCat, all the cars in the Cat series used basically the same drive

SCHUMACHER

# BOSS CAT

by  
ALEX  
STROUTHOPOULOS

system: belt drives that ran to the rear end and a long belt that ran *under* the chassis to connect the front and rear diffs. You adjusted the rear belt tension with eccentric bearing holders; you adjusted the

A R E N T



## SPECIFICATIONS

Manufacturer ..... Schumacher  
Type ..... Off-road  
Scale ..... 1/10  
Price ..... \$499.95

### DIMENSIONS:

Overall length ... 14.75 inches  
Width ..... 9.625 inches  
Wheelbase ..... 11 inches  
Front track ..... 8.5 inches  
Rear track ..... 8.125 inches

### WEIGHT:

Gross (with battery) ..... 3 pounds, 7.66 ounces

### BODY:

Type ..... Buggy  
Material ..... Polycarbonate

### CHASSIS:

Type ..... Dual-plane pan  
Material ..... Graphite

### DRIVE TRAIN:

Primary ..... Gear  
Transmission ..... Belt  
Differential(s) ..... Twin ball diffs  
Bearings/bushings ..... Rubber-sealed ball bearings

### SUSPENSION:

Type (front/rear) ..... Single A-arm with upper control link  
Damping (front/rear) ..... Oil-filled, coil-over shocks

### WHEELS:

Front: Type ..... Aero-disk  
Dimensions (DxW) ..... 2.2x.8 inches  
Rear: Type ..... Aero-disk  
Dimensions (DxW) ..... 2.2x1.5 inches

### TIRES:

Front/Rear ..... Medium-cut spikes

### ELECTRICS:

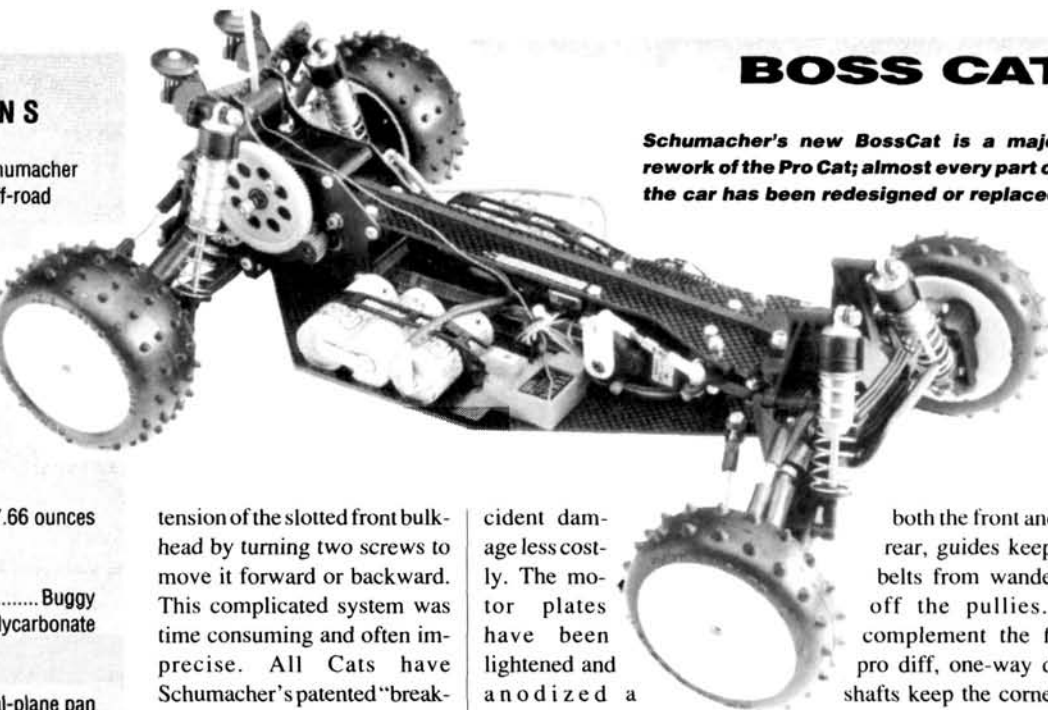
Motor ..... .05"  
Battery ..... 6- or 7-cell saddle pack\*  
Speed Controller ..... Electronic\*

### OPTIONS AS TESTED:

LRP Black E motor and connectors; Tekin 411P ESC and TFM micro receiver; Airtronics Caliber 3P radio; Trinity Pushed Panasonic P-170 SCRs

### COMMENTS:

The BossCat is probably the most sophisticated off-road car on the market, but it isn't complicated. The BossCat is easy to assemble and maintain, and it performs unbelievably well. It's amazing to compare a hot 4WD car with a 2WD car. Not only does the 4WD stay on power longer into and out of the turns, but the amount of steering the car has enables you to turn in under any car on the track. I just wish that there were more 4WD competition.



## BOSS CAT

Schumacher's new BossCat is a major rework of the Pro Cat; almost every part on the car has been redesigned or replaced.

tension of the slotted front bulkhead by turning two screws to move it forward or backward. This complicated system was time consuming and often imprecise. All Cats have Schumacher's patented "break-away" front end that allows the suspension to pivot back and prevent damage in a crash.

Like most 4WD vehicles, the BossCat has a belt that runs along the top of its chassis. It also has a fixed front bulkhead with an eccentric bearing holder (similar to the one on its rear) that allows you to make more precise front belt tension adjustments. The front arms and upper linkages are reversible, so you can adjust the caster; the twin front A-arms have been replaced by an adjustable upper control link setup, so you can adjust the camber. The dirt disks have been removed, so the front hub carriers are smaller (more about that later). Finally, the suspension parts are molded of PEP (performance-engineered polymer), which is super stiff and almost unbreakable. This improved front end is simple and strong.

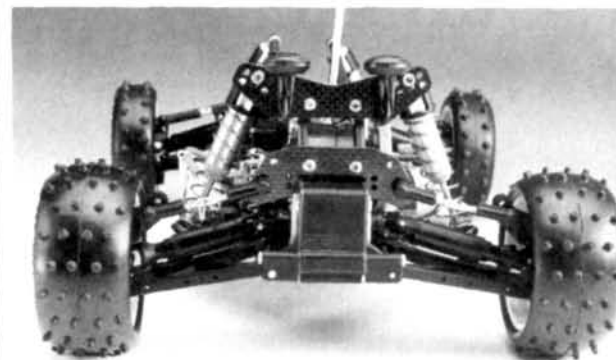
### ...TO TAIL

Schumacher refined the rear-end setup used on previous Cats to create that used on the BossCat. The dirt disks have also been removed from the rear hub carriers, which are connected to the chassis using the same A-arms that are used on the Cougar II. The 1/8-inch-long hinge pins that hold the arms to the chassis don't bend as easily as the older, smaller pins, and this should make ac-

cident damage less costly. The motor plates have been lightened and anodized a beautiful fire-engine red. The shock tower and rear-suspension bracket are mounted on a one-piece assembly between the motor plates. (The older Cat's shock tower and suspension brackets were mounted on two pieces, and this often led to misalignment.) The rear end also includes a new set of "break-away" wing mounts that should

both the front and the rear, guides keep the belts from wandering off the pulleys. To complement the front pro diff, one-way drive shafts keep the cornering radius tight and minimize drag on the straights.

A slipper clutch has been added to the upper layshaft to smooth the power transfer and to reduce shock to the drive train when the car lands from jumps. This unit, which consists of two hard-anodized Teflon-coated pressure plates, is identical to the one on the Cougar II.



Schumacher pioneered the rear slider-style drive shafts. All the suspension components have been molded of super-stiff PEP.

lengthen the life of your wings.

### DRIVE TRAIN

Schumacher upgraded the drive train with its new pro diffs, front and rear. Carbide diff balls, three ball bearings and large, hardened rings that are mounted on no-slip carriers make for super-smooth action. The diff pulleys aren't drum-shaped like those on previous Cats; instead, they're flat. In

### VARI-NICE

In my opinion, the new Vari-shocks are the best shocks Schumacher has ever made! They have hard-anodized aluminum bodies, rebuildable cartridges, foam volume compensators and Teflon pistons that provide adjustable damping.

You can rotate the two-piece pistons to change the number of holes, i.e., valving,

\*not included

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## BOSS CAT

from one to four. Now you can take one bottle of 20WT shock oil to the track and simply adjust the valving to vary the damping from soft to firm.

The kit comes with Schumacher's spring-tuning kits and the often-copied spring clips, which allow you to adjust the spring tension quickly and precisely.



**The front end's reversible A-arms and upper links allow you to adjust caster from 9 to 21 degrees. These beefy turnbuckles aren't likely to break during a crash.**

### TIRES AND WHEELS

The 2.2-inch Aero-disk rims that come with the BossCat kit are smooth on the inside to keep dirt and mud from clogging the rim. Snap-in shields keep dirt from sticking to the outside of the wheel. These new rims have made the dirt shields previously used on the front and rear hub carriers obsolete. It's too bad that ROAR rules prohibit the use of 2.2-inch rims, but Schumacher's 2.15-inch-diameter rims will fit the BossCat. The kit also includes 2.2-inch front and rear tires. They should work well on most tracks.

### RADIO EQUIPMENT

I used my trusty Airtronics\* Caliber 3P with the BossCat, but I needed another FM receiver. I chose Tekin's\* new TFM mini receiver, which is very small and light. In fact, its dimensions are the same as those of the Tekin TER-X AM micro receiver! To complement the TFM, I installed a Tekin 411P ESC.

When I wired up the BossCat, I discovered the new LRP\* connectors that Schumacher imports. They're supposed

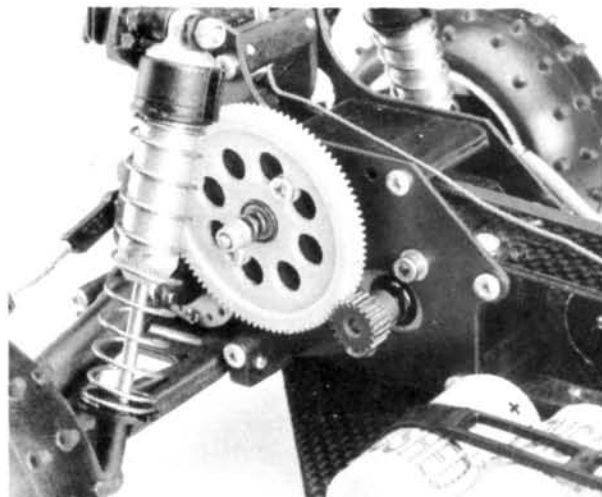
to have less resistance than a piece of 14AWG wire.

I chose LRP's Black E motor for the BossCat. (LRP doesn't rate its motors by wind, i.e., 14-wind, triple-turn, but by letter and color. The Black E is LRP's fastest.) Every motor comes with a gear chart and the recommended gearing for several popular cars. A set of Trinity\* Pushed Matched Panasonic P-170 SCRs powers this beast. Their extended capacity and durability make these batteries just the ticket for 4WD racing.

Topping off the BossCat is a killer paint job from the grand wizard of the airbrush, Richard Muise of Motion Graphics\*. How he can consistently turn out such incredible bodies at such affordable prices, I don't know!

### TESTING

I tested the BossCat at a local indoor off-road track. I set up the Vari-shocks with three holes open in each piston and filled them with 20WT Associated\* oil. I installed Schumacher's M4 springs up front and R2 springs on the rear. I mounted the front shocks in the no. 2 hole in the A-arm and the rear shocks in the no. 3 hole in the A-arm and the upper-middle hole in the shock tower. This



**Schumacher's new Vari-shocks have pistons with adjustable valving. Notice the new slipper clutch behind the spur gear.**



setup is recommended in the manual, but I didn't think it would provide much suspension travel.

The car worked well initially, but, as I suspected, there wasn't enough suspension travel to handle the bumps. I moved the shocks inward on the arms (to the no. 1 hole in front and no. 2 hole in the rear), which gave the car more travel—too much travel! Under power, the BossCat's front end had too much lift, and this caused it to lose steering. I put 10mm spacers in all of the shocks, and this allowed the car more suspension travel than the no. 2 and no. 3 holes, but not so much that steering is lost under power. To help the car handle better over the washboards, I switched to 15WT oil in the rear shocks and 25WT in the front shocks. I also switched to Schumacher 8x20 mini-spike front tires and Yokomo\* TR-32 rears. After these changes, the car handled as if it was on rails.

**It's really amazing to compare a "hooked-up" 4WD car with a 2WD car. Not only does the 4WD stay on power longer into and out of the turns, but the amount of steering that the car has enables you to turn in under any car on the track!**

It's really amazing to compare a "hooked-up" 4WD car with a 2WD car. Not only does the 4WD stay on power longer into and out of the turns, but the amount of steering that the car has enables you to turn in under any car on the track! I just wish that there was more 4WD competition.

I've raced the BossCat for a few weeks, and I think it's the best car that Schumacher has ever produced! Out of the box, it's on a par with the national-champ Kyosho Lazer ZX-R and the world-champ Yokomo Works 91. To say that the BossCat has impressed me is an understatement!

*\*Here are the addresses of the companies mentioned in this article:*

**Schumacher Inc.**, 6302 Benjamin Rd., Ste. 404, Tampa FL 33634.

**Airtronics Inc.**, 11 Autry, Irvine, CA 92718.

**Tekin Electronics**, 970 Calle Negocio, San Clemente, CA 92672.

**LRP**: distributed by Schumacher.

**Trinity Products Inc.**, 1901 E. Linden Ave. #8, Linden, NJ, 07036.

**Motion Graphics**, 2645 Robert Arthur Rd., Westminster, MD 21158.

**Associated Electronics Inc.**, 3585 Cadillac Ave., Costa Mesa, CA 92626.

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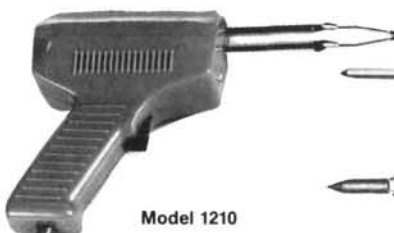
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## LETTERS

(Continued from page 74)

### BOGUS BREAKAGE

I have a couple of questions about off-road trucks. I heard from a friend that, at his local track, a guy races an RC10T and says that, during just about every race, he breaks something—either gears, or something in the steering. (By the way, he's the only one who races an RC10T.)

I was planning to buy this truck, but now I'm not sure. Have you had any trouble with the RC10T? Do you think the Blue Eagle LS would be a better choice? I thought Associated was known for its high-quality, durable kits. I hope you can help. And will the A&L Slam It body fit the RC10T? Keep up the great work.

ARLO WETZEL  
Alden, MI

Arlo, what is this guy doing to his RC10T?—throwing it across the track? Something is wrong; we've never had any trouble with our 10Ts. Yes, Associated is well-known for its durable kits. It sounds as if this guy is definitely doing something wrong: either smashing into obstacles at full speed, or failing to maintain his truck properly.

As for the Blue Eagle LS, we like that kit, too. Both could take you to the winners' circle.

JH

(Continued on page 112)

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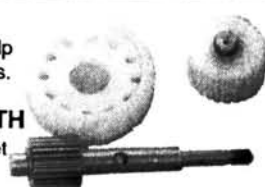


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## LETTERS

(Continued from page 108)

### CLUB MED

Regarding Jeff Bronstein's column, "Nitro News," in the May issue: I'm surprised to learn that U.S. R/C drivers have difficulty finding race tracks! Owing to the scarcity of land, there was no organized track in Hong Kong, but after reading your article, I felt I needed to do something to solve this long-time problem.

With lots of luck and help from my relatives, I found a grassland about 11,000 square feet. It's just 1.3 miles from a mass-transit station. I rent the space at an economical rate. Since I don't have the experience of forming a club or establishing a race track, I need your help very much now on how to design a nice off-road track, to make the club well-organized and well-equipped, and to establish a set of rules.

Could you give me the addresses, telephone numbers and fax numbers of ROAR and NORRCA? Thank you! I'm very hungry for any useful information. I wish I could have your feedback as soon as yesterday. Thank you very, very much for your prompt assistance!

PAK YEUNG  
Tai Wai, Hong Kong

*Pak, it's unfortunate that we don't have as many race tracks as we'd like, but it's difficult to make a living by having fun. I suggest that you contact a few tracks here in the States for advice on layouts and organization. Also, contact John Grant, president of the Far East Model Car Association (FEMCA). He may be able to help you with rules and equipment. It's most important that you race the type of car that's most popular in Hong Kong; whether it's Formula, off-road, rally, or something else. One thing is sure, however: once you make it your business to race, racing will never be the same for you.*

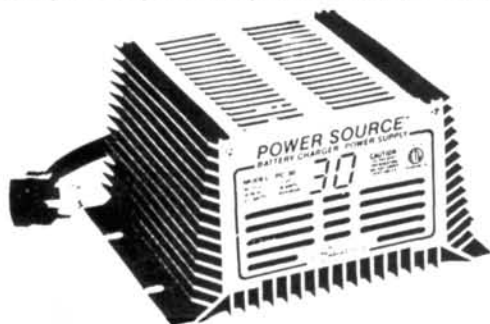
*Good luck; I hope to see a photo of your track soon!*

JB

(Continued on page 132)

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**Main Street Raceway**, 156 Main St., Trussville, AL 35173; Paul Spivey, (205) 655-3868



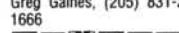
**Oak Mountain Raceway & R/C Club**, 2624 Janice Circle, Birmingham, AL 35235; Will Barrett, (205) 856-7051



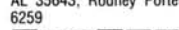
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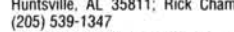
**Piedmont R/C Superspeedway**, 41 Jewel Lane, Oxford, AL 36203; Terry Young or Greg Gaines, (205) 831-2986 or 831-1666



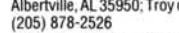
**R&J's Raceway**, County Rd. 236, Trinity, AL 35643; Rodney Porter, (205) 351-6259



**R/C Hi-Tech Raceway**, 3303 Meridian St., Huntsville, AL 35811; Rick Chambers, (205) 539-1347



**Satellite Hobbies**, 2799 Rose Rd., Albertville, AL 35950; Troy or Jerry Smith, (205) 878-2526



### ALASKA

**ARCORR**, P.O. Box 221253, Anchorage, AK 99522-1253; Rick Ricker, (907) 248-7390



**McKinley Hobby & Raceway**, 2300 McKinley Dr., Wasilla, AK 99654; (907) 376-9351



**Seth's Speedways**, 3400 Hiland Dr., Anchorage, AK 99504; Seth Graham, (907) 337-3777



**Southtown Hobby & Raceway**, 12001 Industry Way #2, Anchorage, AK 99515; Bob or Vickie Peters, (907) 345-3131



### ARIZONA

**Economy One-Stop Raceway**, 4000 S. 4 Ave., Yuma, AZ 85366; (602) 344-3514



**Finish Line Raceway**, 7025 E. 21st St., Tucson, AZ 85710; Jerry Kikkert, (602) 747-3633



**G&S Raceway**, 967 Hancock, Bullhead City, AZ 86442; Bob Olsen, (602) 758-1100



**Havasu R/C Raceway**, 1081 Desert View Dr., Lake Havasu City, AZ 86403; Bernie Coates, (602) 680-6304



**HobbyTown Raceway**, 9180 E. Indian Bend Rd., Scottsdale, AZ 85250; Dennis, (602) 948-3946



**HobbyTown Raceway**, 1915 East Baseline Rd., Gilbert, AZ 95234; Kenny, (602) 892-0405



**Outlaw Raceway**, 5309 Lakewood Rd., Ft. Mohave, AZ 86427; Frank Greely, (602) 768-5001



**Overmyer's Speedrome**, P.O. Box 541, Bullhead City, AZ 86430; Sarge Overmyer, (602) 758-2463



**R/C Raceplex**, 5222 W. Glendale Ave., Glendale, AZ 85031; Rick Younker, (602) 934-5567



**R/C Sports Mania**, 3550 N. 35th Ave., Phoenix, AZ 85017; (602) 996-4668



**Race Prep Raceway**, 852 S. Hwy. 89, Chino Valley, AZ 86323; Mike Dunn, (602) 636-1955



**Scale Racing Sports**, 1120 N. Hayden Rd., Tempe, AZ 85281; Mike, (602) 829-9117



**Sierra Vista Raceway**, 105 N. Central Ave., Sierra Vista, AZ 85635; Wayne Tuthill Sr., (602) 459-1335



**Speedway Hobbies**, 1000 N. Humphreys St., #204, Flagstaff, AZ 86001; Gary McAllister, (602) 556-0710



### ARKANSAS

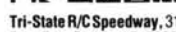
**AERCC**, Vimy Ridge Rd., Little Rock, AR; (501) 945-7037



**Arkansas Int'l. Superspeedway**, P.O. Box 1636, Pine Bluff, AR 71613; Joe Pitts, (501) 247-2371



**Ozark Hobby Shop**, 702 S. 2nd, Rogers, AR 72756; Joe Talariski, (501) 631-6871



**Tri-State R/C Speedway**, 3112 Cavanaugh Rd., Fort Smith, AR 72903; Village R/C Hobbies, (501) 646-3701



### CALIFORNIA

**AppleTree Raceway**, 1303 Hermosa Ave., Pacifica, CA 94044; Sonny Day, (415) 359-9755



**ARO Hobbies Raceway**, 24275 Sunnymead, Moreno Valley, CA 92553; George or Mike Kileen, (714) 924-3240



**Art & Dean Raceway**, 29409 Haguett, Lake Elsinore, CA 92530; Art, (714) 245-0920



**Bob & Jim's R/C World**, 3485 University Ave., Riverside, CA 92501; Bob Parcell, (714) 684-6314



**Brake-a-way Raceway**, 3179 Hamner Ave., Norco, CA 91760; Debbie Burrie, (714) 736-6063



**California Auto Racers (CAR)**, 96 San Tomas Aquino Rd., Campbell, CA 95008; Club Message Line, (415) 508-9971



**City Speedway**, 7750 Convoct Ct., San Diego, CA 92111; (619) 560-9633



**Cloverdale R/C Raceway**, 1 Citrus Fair Dr., Cloverdale, CA 95425; Tom Kelley, (707) 586-9789



**Covina Racing Company**, 1611 W. San Bernardino Rd., Covina, CA 91722; Tom, (818) 331-4984



**Cycle Art Raceway**, 2211 N. Pleasant Way, Fresno, CA 93705; Richard De Benedictis, (209) 233-3665



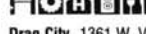
**D&D Raceway**, 290 S. First St., Turlock, CA 95380; Dave Miller, (209) 667-0970



**Desert R/C Raceway**, 9231 E. Hobson Way, Blythe, CA 92225; Rodney Lazenby, (619) 922-5516



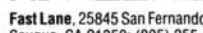
**Desert R/C Raceway**, 39360 3rd St. E., Ste. 305, Palmdale, CA 93550; (805) 272-1835



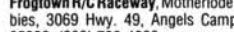
**Drag City**, 1361 W. Valley Blvd., Colton, CA 93234; Chris Gabriel, (714) 370-0580



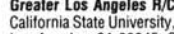
**Fast Eddie's R/C Raceway**, 3261 Edward Ave., Santa Clara, CA 95054; Eddie Aflague, (408) 986-8256



**Fast Lane**, 25845 San Fernando Rd., #21, Saugus, CA 91350; (805) 255-2404



**Frogdown R/C Raceway**, Motherlode Hobbies, 3069 Hwy. 49, Angels Camp, CA 95222; (209) 736-4989



**Greater Los Angeles R/C Racing Club**, California State University, Parking Lot A, Los Angeles, CA 90045; Glenn Williams, (213) 734-7888 or Tom Wong, (310) 821-5472



**Hayes Raceway**, 628 Walnut Ave., Patterson, CA 95363; Andy Hayes, (204) 892-5080



**Hobby Haven Raceway**, 3983 First St., Livermore, CA 94550; Tom Welding Jr., (510) 443-5828



**Hobbycrafters Raceway**, 323 Five Cities Dr., Pismo Beach, CA 93449; (805) 773-6765



**Jackman's R/C Raceway**, 1616 N. Beale Rd., Marysville, CA 95901; Bonnie or Harry Jackman, (916) 741-3744



**K&M R/C Raceway**, 22474 A Barton Rd., Grand Terrace, CA 92324; Mike Blake, (714) 783-0899



**The Land of R/C**, 2717 Gerber Road, Suite B, Woodland, CA 95695; Le Forrest, (916) 666-1699



**Lyndsey's R/C Raceway**, P.O. Box 443, Diego, CA 96109; (916) 827-2457



**Lucerne Valley Raceway**, 32800 #4 Old Woman Springs, Lucerne Valley, CA 92356; Frank Rodriguez, (619) 248-7305



**M'n'M Hobbies**, 710 E. Parkridge, Corona, CA 91719; Don Hughes, (714) 272-3545



**Merced R/C Auto Racers (MRCAR)**, 1652 W. North Bearcreek Dr., Merced, CA 95348; Ed Lopez, (209) 725-8040



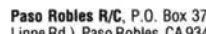
**My Hobby Shop**, 1525 Farmers Ln., Santa Rosa, CA 95405; Mike, (707) 571-1700



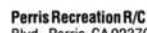
**One-Stop Raceway**, 3782 Cerritos Ave., Los Alamitos, CA 90720; (213) 493-7597



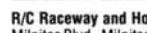
**Outlaw R/C Hobbies**, 7920 Webster, San Bernardino-Highland, CA 92346; Rick James or Paul Nadeau, (714) 864-1770



**Paso Robles R/C**, P.O. Box 3795 (3980 Linne Rd.), Paso Robles, CA 93447; (805) 237-0624



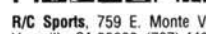
**Perris Recreation R/C Track**, 120 N. Perris Blvd., Perris, CA 92370; Len or Fay Shirley, (714) 943-6603 or 657-4879



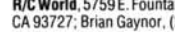
**R/C Raceway and Hobbies**, 1453 North Milpitas Blvd., Milpitas, CA 95035; Tom or Bonnie Grader, (408) 262-3188



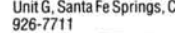
**R/C Racing Center**, 9842 Channel Rd., Lakeside, CA 92040; Russ or Cindy, (619) 443-2270



**R/C Sports**, 759 E. Monte Vista Ave., Vacaville, CA 95688; (707) 446-5555



**R/C World**, 5759 E. Fountain Way, Fresno, CA 93727; Brian Gaynor, (209) 348-9409



**The Race Place**, 13564 E. Imperial Hwy. Unit G, Santa Fe Springs, CA 90670; (213) 926-7711



**Race Prep Raceway**, 20115 Nordhoff, Chatsworth, CA 91311; Steve Dunn, (818) 709-6800



**Radio-Controlled Hobbies**, 2011 Placentia Ave., Costa Mesa, CA 92630; (714) 631-1555



**Radiowave Hobbies**, 4572 Telephone Rd., Ventura, CA 93003; Al Young, (805) 642-0390



**Ranch Pit Shop**, 1655 E. Mission Blvd., Pomona, CA 91766; Billy Bowlerman, (714) 623-1506



**RnR Hobbies**, 701 E. Ave. I, Lancaster, CA 93534; Robert or Ron, (805) 949-1552



**Robin's Racing World**, 1844 W. Glenoaks, Glendale, CA 91201; (818) 240-2093



**Roy's Raceway**, 368 E. 11th St., Tracy, CA 95516; (209) 836-3513





# Track Directory

**Ventura Road Runners/Freedom Park Raceway**, 520 Freedom Park, Camarillo, CA 93010; Les Abramson, (805) 484-8920 or Ed Haney, (805) 499-8266



**White Mountain R/C Raceway**, 174 West Line, Bishop, CA 93514; (619) 872-1599



**Yorba Linda R/C Speedway**, 3780 Prospect #8, Yorba Linda, CA 92685; David Landier, (714) 572-2175



## COLORADO

**Action R/C Raceway**, 4939 N. Broadway #57, Boulder, CO 80304; (303) 440-0330



**Colorado R/C Speedway**, 6520 Wadsworth Blvd. #130, Arvada, CO 80003; (303) 425-1718



**Hot Lap Hobbies & Raceway**, 4206 Wadsworth, Wheat Ridge, CO 80034; Phil Cotter, (303) 420-3051



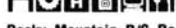
**MHOR R/C Raceway**, 15540 E. Batavia Dr., Aurora, CO 80011; Jess Brockman, (303) 343-0151



**R/C Mini Sports**, 6401 Broadway, Unit G, Denver, CO 80223; Bernie Stolpman, (303) 650-2500



**R/C World & Track**, 2788 S. Federal Blvd., Denver, CO 80236; (303) 789-0838



**Rocky Mountain R/C Raceway**, 5737 Constitution Ave., Colorado Springs, CO 80915; Lee Seigel, (719) 550-1777



## CONNECTICUT

**Crafttech Raceway**, Navsubase N10N Box 14, Bldg. 460, Groton, CT 06349; Dave or Tony, (203) 449-3217



**East Hartford R/C Speedway**, 52 Village St., East Hartford, CT 06108; Bob Matulis, (203) 528-8566



**High-Tech Raceway**, 375 Enfield St., Enfield, CT 06082; (203) 745-8488



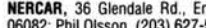
**Hobby World Raceways**, 161-6 Woodford Ave., Plainville, CT 06062; (203) 793-1111



**JP's Hobbies & Track**, 54 Wakelee St., Ext., Seymour, CT 06483; (800) 547-5772



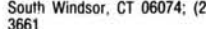
**K/N R/C Speedway Inc.**, West St., Stafford Springs, CT 06076; (203) 684-9896



**NERCAR**, 36 Glendale Rd., Enfield, CT 06082; Phil Olsson, (203) 627-5410



**R/C Madness**, 640 Enfield St., P.O. Box 64, Enfield, CT 06082; Christopher Marcy, (203) 741-6501



**R/C Raceways Inc.**, 1265 John Fitch Blvd., South Windsor, CT 06074; (203) 528-3661



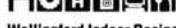
**R/C World/Sugar Hollow Speedway**, 66 Sugar Hollow Rd., Danbury, CT 06810; (203) 748-2185



**SCORA/Clayton's Off-Road Racing**, 141A Middletown Ave., North Haven, CT 06473; Craig or Keith, (203) 234-CLAY



**Tec Tron's R/C Stadium**, 52 Village St., E. Hartford, 06108; (203) 289-8119



**Wallingford Indoor Racing**, 63 N. Cherry St., Wallingford, CT 06492; (203) 265-3939



## DELAWARE

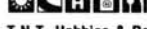
**Hobby Works Raceway**, Hamlet Shopping Center, Dover, DE 19901; Steve or Gordon, (302) 674-9123



**Mills Raceway**, RD 2 Box 83D-8, Milford, DE 19963; Mike Roe, (302) 422-6766



**T&C Raceway**, Rt. 113 South, Georgetown, DE 19947; Sam Thompson Jr., (302) 856-3804



**T.N.T. Hobbies & Raceway**, 609 Stein Hwy., Seaford, DE 19973-0464; Thorpe Shatney, (302) 628-0520

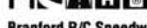


## FLORIDA

**B+T R/C Central**, 811 Playground Rd., Ft. Walton Beach, FL 32547; (904) 863-2666



**Barry's R/C Raceway**, 2701 SW College Rd. #603, Ocala, FL 32674; Barry Lees, (904) 237-4400



**Branford R/C Speedway**, Rt. 3, Box 240, Branford, FL 32008; (904) 935-0758



**Coral Springs Roadrunners**, P.O. Box 9632, Coral Springs, FL 33075; Tom Allison, (305) 721-0344 or Rick Schwartz, (305) 344-1983



**5-lifty-5 Raceway**, County Rd. 555, Bartow, FL 33830; Chuck Nolke, (813) 324-7406



**First Coast International Speedway**, P.O. Box 1342, Jacksonville, FL 32201-1342; Bob Thompson, (904) 743-2161



**Fl. Lauderdale R/C Speedways**, 2201 NW 9th Ave., Mills Pond Park, Ft. Lauderdale, FL 33308; Jack or Diane Koons, (305) 424-6617



**Greater Orlando Auto Racers**, 970 Keller Rd., Altamonte Springs, FL 32714; Dave Mottin, (407) 293-7090



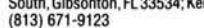
**H&H Raceway**, 4121 S. Tamiami Tr., Sarasota, FL 34231; (813) 922-7711



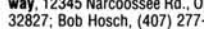
**Hialeah Hobby Raceway**, 4562 W. 12 Ave., Hialeah, FL 33015; (305) 826-3702



**JARCAR Raceway**, 7273 103rd St., Jacksonville, FL; Rob Kruse, (904) 272-6315



**Kenny's Track & Hobby**, 11125 U.S. 41 South, Gibsonton, FL 33534; Kenny Ryals, (813) 671-9123



**Lake Whipoorwill International Speedway**, 12345 Narcossee Rd., Orlando, FL 32827; Bob Hosh, (407) 277-9586; fax (407) 277-2562



**Lou's R/C Hobbies & Raceway**, 1512 SE Village Green Dr., Port St. Lucie, FL 34952; (407) 337-9000



**M&M R/C Raceway**, 16921 Waterline Rd., Bradenton, FL 34202; Mike Williams, (813) 747-2889



**Martin County Championship R/C Speedway**, 2953 S.E. Ellendale St., Stuart, FL 34997; Jerry Landry, (407) 220-1816



**McBiffy R/C Raceway**, 3rd St., Center, Cedar Key, FL 32625; Wilbur McBiffy, (904) 543-5628



**Miami Speedway**, 7805 NW 148th St., Miami Lakes, FL 33014; Julio Romero, (305) 687-6728



**Ocala R/C Car Club**, P.O. Box 70166, Ocala, FL 32670; Larry E. Mitchell, (904) 245-2609; Steve Shook, (904) 694-5147



**Oceanside Raceway**, 206 E. Eau Gallie Blvd., Indian Harbour Beach, FL 32937; Michael Kelly, (407) 242-0434



**Paul's R/C Track & Hobby**, 4605 W. Cayuga St., Tampa, FL 33614; Paul or Eula Surrette, (813) 872-8662



**PBG R/C Motorpark**, 4399 Lilac St., Palm Beach Gardens, FL 33410; Doug Gleason, (407) 624-9252



**Performance Plus Raceway**, 2820 SE 62 St., Ocala, FL 34481; Charlie Floyd or Cari Ross, (904) 867-5557



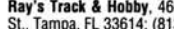
**Pro Hobbies Speedway**, 715 N. Lake Pleasant Rd., Apopka, FL 32712; (407) 886-4615



**R/C Action**, 646 Choy Lee Circle, Orlando, FL 32708; (407) 695-6746



**Raceway Hobbies**, 1115-J Enterprise Ct., Holly Hill, FL 32117; (904) 258-7537



**Ray's Track & Hobby**, 4605 W. Cayuga St., Tampa, FL 33614; (813) 872-8662



**Rental Raceway**, 3655 S. Hopkins Ave., Titusville, FL 32780; (407) 383-0631



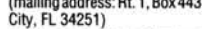
**River City R/C Car Club**, 9711 Sharing Cross Dr., Jacksonville, FL 32257; Bill Fraden, (904) 268-1948



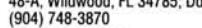
**St. Augustine R/C Speedway**, 99 Masters Dr., St. Augustine, FL 32095; (904) 824-6357



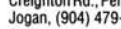
**Space Coast Raceway**, 563 Barton Blvd., #17, Rockledge, FL 32955; Bill Pinch, (405) 631-4373



**Sun Valley Speedway**, Palmer Blvd., Sarasota, FL 34232; (813) 322-1200; (mailing address: Rt. 1, Box 443N, Myakka City, FL 34251)



**Three Flags R/C Racetrack**, Rt. 2, Box 48-A, Wildwood, FL 34785; Don Meares, (904) 748-3870



**TJ's R/C Raceway & Hobby Shop**, 1010 Creighton Rd., Pensacola, FL 32504; John Jogan, (904) 479-2330



**West Coast R/C Club**, Lake Park, 17203 N. Dale Marry, Tampa, FL 33549; Tim O'Daffer, days, (813) 969-3683; evenings, (813) 239-9630



**Wilbur Avenue Raceway**, 1848 Wilbur Ave., Vero Beach, FL 32960; (407) 567-1200

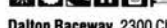


## GEORGIA

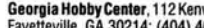
**Carnesville R/C Speedway**, Rt. 2, Box 2354, Carnesville, GA 30521; Bobby Maxwell or Byron Sartain, (404) 384-4870 or 384-4587



**Case R/C Raceway**, P.O. Box 1061, Trenton, GA 30752; (404) 657-6789



**Dalton Raceway**, 2300 Chattanooga Rd., Dalton, GA 30720; (404) 226-6699



**Georgia Hobby Center**, 112 Kenwood Rd., Fayetteville, GA 30214; (404) 460-1753



**Good Life City Raceway**, 6606 Newton Rd., Albany, GA 31707; (912) 888-2515



**Lake Mayer Raceway**, 1 Melinda, Savannah, GA 31460; Phil Hurd, (912) 355-6033



**Middle GA Slot Car**, 1805A Watson Blvd., Warner Robins, GA 31088; Larry Tucker, (912) 922-RACE



**PDQ Raceway & Hobbies**, 341 Senoia Rd., Peachtree City, GA 30269; Richard Ross, (404) 631-1788



**Peach Bowl R/C Speedway**, 2035 Westside Ct., Snellville, GA 30278; (404) 985-1448



**The Racer's Edge**, 1530 Hwy. 19 North, Thomaston, GA 30286; Mark or Roger Walls, (404) 648-6534



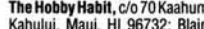
**Sandy Cross Speedway**, Rt. 1, Box 1073, Royston, GA 30662; Morris Phillips or Wayne Fowler, (404) 245-9573



**Silver Wings Raceway**, 5611 Riverdale Rd., College Park, GA 30349; (404) 991-2225



**Sugar Bowl R/C Speedway**, 5272 North Ave., Sugar Hill, GA 30518; Shelley or Jan Bailey, (404) 945-6709



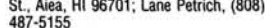
## HAWAII

**The Hobby Habit**, c/o 70 Kaahumanu Ave., Kahului, Maui, HI 96732; Blaine or Teri Ferreira, (808) 871-6666

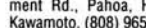


**K/M's Hobbies**, 2305 Jasmine St., Honolulu, HI 96816; George Mirikiana, (808) 757-7135

**R/C Motorsports Hawaii**, 98-029 Hekaha St., Aiea, HI 96701; Lane Petrich, (808) 487-5155



**Team PRC Racing Club**, Pahoehoe Government Rd., Pahoehoe, HI 96778; Charlie Kawamoto, (808) 965-8216



## IDAHO

**Falls Hobbies & R/C Raceway**, 1515 Northgate Mile, Idaho Falls, ID 83401; (208) 529-8650

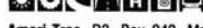


## ILLINOIS

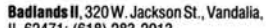
**Adam's Blast Track**, RR 1, Box 370, Ashmore, IL 61912; John Deffenbaugh, (217) 349-8447



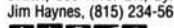
**AJ's Raceway**, Kesslinger Road, Dekalb, IL 60115; A.J. Schultz, (815) 756-2772



**Ameri-Trac**, R3, Box 242, Mattoon, IL 61938; (217) 234-8707



**Badlands II**, 320W. Jackson St., Vandalia, IL 62471; (618) 283-2913



**BARR**, 809 River Dr., Byron, IL 61010; Jim Haynes, (815) 234-5615



**C&R Hobbies**, 39 E. Jones, Milford, IL 60953; Ray Craighead, (815) 889-4073



**Centennial Park/LeMont Dirt Burners**, 7827 Rohrer Dr., Downers Grove, IL 60516; Scott Moravik, (708) 968-6411

**Marty's R/C Hobby**, 1335 E. Broadway, Bradley, IL 60915; Gail or Marty, (815) 933-8441



**Mercer Co. R/C Off-Road**, RR 3 Box 259, Milan, IL 61264; Jamie Wagal, (309) 534-8324



**Midwest Hobby Trax**, 114 Kirkland Cr., Unit A, Oswego, IL 60543; Duane Pierson or John Koonce, (708) 978-RACE



**Monee R/C Raceway**, 26049 Ridgeland Ave., Monee, IL 60449; (708) 534-2422



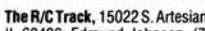
**Peoria R/C Raceway**, 518 Hillsdale Ave., Peoria, IL 61604; Ray Tighe, (309) 672-1780



**Precision Speedway**, 3919 17 St., East Moline, IL 61244; Dan Kennedy, (309) 796-2226



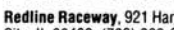
**R/C Speed Zone**, 1400 E. Lafayette, Bloomington, IL 61701; (309) 662-RACE



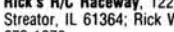
**The R/C Track**, 15022 S. Artesian, Harvey, IL 60426; Edmund Johnson, (708) 331-4079



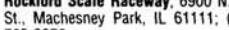
**Radio Active Raceways**, 751 N. Bolingbrook Dr., #15, Bolingbrook, IL 60440; Jim or Lenny, (708) 759-7557



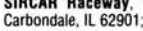
**Redline Raceway**, 921 Harding, Calumet City, IL 60409; (708) 862-8181



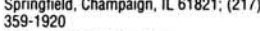
**Rick's R/C Raceway**, 122 W. 12th St., Streator, IL 61364; Rick Wallace, (815) 673-1870



**Rockford Scale Raceway**, 6900 N. 2nd St., Machesney Park, IL 61111; (815) 765-2970



**SIRCAR Raceway**, 1200 N. Marion, Carbondale, IL 62901; (618) 549-5885



**Slot Wing Hobbies Race Place**, 1615 W. Springfield, Champaign, IL 61821; (217) 359-1920



**Smithton Community Park**, P.O. Box 8152, Belleville, IL 62221; (618) 236-7569



**Superior Raceway**, 1706 W. Bradley, Champaign, IL 61821; (217) 359-8073



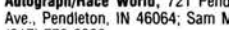
**Thunder Road Speedway**, Intersection of Broadway and Division, Coal City, IL 60416; (815) 634-2540



**TQ Hobbies & Raceway**, 13710 Wicker Ave. (Rt. 41), Cedar Lake, IL 60303; Jack Wilson, (219) 374-9776



**Valley Farms R/C Raceway**, 706 Bypass 20, Cherry Valley, IL 61016; (815) 332-4516



## INDIANA

**Autograph/Race World**, 721 Pendleton Ave., Pendleton, IN 46064; Sam Mudd, (317) 778-3386



**BJ's Riverside Raceway**, 265 S. Clay St., Jasper, IN 47546; Joe Lorey, (812) 482-3484



**Blaze'n Race'n**, P.O. Box 6, Hamlet, IN 46532; James Berndt, (219) 867-1324



**Boone County R/C Track**, 1300 E. 100 S. Rd., Lebanon, IN 46052; Jerri Moss, (317) 293-2225



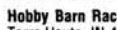
**CC Hobby & Speedway**, RR 1, Box 68, Francesville, IN 47946; (219) 567-2447



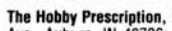
**Classic Hobbies**, 420 E. Commercial, Lowell, IN 46356; David Scheffler, (219) 696-0649



**County Line R/C**, 2333 W. State Rd. 38, Sheridan, IN 46089; Greg Welch, (317) 758-6393



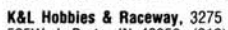
**Hobby Barn Raceway**, 1950 Springhill, Terre Haute, IN 47802-9694; (812) 299-5773



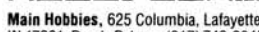
**The Hobby Prescription**, 115 S. Indiana Ave., Auburn, IN 46706; Roxanne Fike, (219) 925-6699



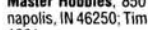
**Hobby World Raceway & Hobbies**, 1508 N. Harlan, Evansville, IN 47711; Jeff Wassman, (812) 421-1100



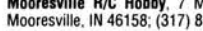
**K&L Hobbies & Raceway**, 3275 North 525W, LaPorte, IN 46350; (219) 324-0353



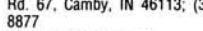
**Main Hobbies**, 625 Columbia, Lafayette, IN 47901; Randy Palmer, (317) 742-2045



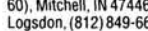
**Master Hobbies**, 8501 Bash Rd., Indianapolis, IN 46250; Tim or Dan, (317) 576-1961



**Mooreville R/C Hobby**, 7 Moore St., Mooreville, IN 46158; (317) 831-8877



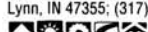
**Mooreville R/C Hobby**, 9201 S. State Rd. 67, Camby, IN 46113; (317) 831-8877



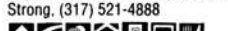
**P&T Hobbies and Raceway**, RR 2 (Hwy 60), Mitchell, IN 47446; Paul Weber, Tom Logsdon, (812) 849-6666; fax, (812) 332-0018



**R/C Barn**, 310 N. 125 W., Monroe, IN 46772; Mark Lengerich, (219) 692-6600



**R/C World of Indiana**, RR #2, Box 335, Lynn, IN 47355; (317) 874-2464



**Race St. Raceway & Hobby**, 1126 1/2 Race St., New Castle, IN 47362; John or Nancy Strong, (317) 521-4888



**Raceway Park**, 919 E. McKinley, Mishawaka, IN 46545; Bob Bean, (219) 256-1020



**Radio Car Craft**, 1925 S. Curry Pike, Bloomington, IN 47403; (812) 332-3245



**The Rink**, 7900 Whitcomb, Merrillville, IN 46410; Don Reimer, (219) 769-8113



**Runway Hobbies Raceway**, 5342 Elmwood, St. J., Indianapolis, IN 46203; Randy Hyatt, (317) 784-2421



## IOWA

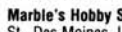
**Dubuque R/C Speedway**, Dubuque County Fairgrounds, Dubuque, IA 52001; Paul Conlon, (319) 556-2736



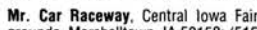
**Kodiak Race Track**, Box 78, Okoboji, IA 51355; Brad or Dave, (712) 332-7982



**M&M Racetrack**, 2434 Pilgrim Path, Oskaloosa, IA 52577; (515) 673-6265



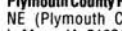
**Marble's Hobby Supply**, 4685 SE 40th St., Des Moines, IA 50320; Rick Marble, (515) 262-7507



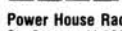
**Mr. Car Raceway**, Central Iowa Fairgrounds, Marshalltown, IA 50158; (515) 483-2234



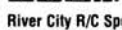
**North Park R/C Speedway**, 805 S. Jerome, Algona, IA 50511; (515) 295-9352



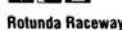
**Plymouth County R/C Speedway**, 4th Ave. NE (Plymouth County Fairgrounds), LeMars, IA 51031; (712) 546-8788 or 546-9522



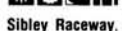
**Power House Racing**, 1200 S. Division St., Creston, IA 50801; (515) 782-4582 or 782-4174



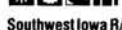
**River City R/C Speedway**, 317 2nd NW, Mason City, IA 50401; Leonard Johnson, (515) 423-7333



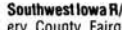
**Rotunda Raceway**, 101 Bass, RR 1, Box 155A, Storm Lake, IA 50588; (712) 732-4555



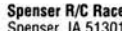
**Sibley Raceway**, Osceola County Fairgrounds, Sibley, IA 51249; Al Reck (712) 754-2604 (day) or 754-3613 (night)



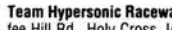
**Southwest Iowa R/C Raceway**, Kelly Park, Red Oak, IA 51566; (712) 623-5513



**Southwest Iowa R/C Raceway**, Montgomery County Fairgrounds, Red Oak, IA 51566; (712) 623-5513



**Spenser R/C Raceway**, 419 Grand Ave., Spenser, IA 51301; Steve or Mike, (712) 262-2603 or -7864



**Team Hypersonic Raceway**, 23075 Coffee Hill Rd., Holy Cross, IA 52053; Dave Lukasik, (319) 870-4665



**Team Johnson Speedway**, Jct. Hwy. 34 & 406, West Burlington, IA 52655; (319) 753-0753



## KANSAS

**ACE Raceway**, 325 Commercial, Emporia, KS 66801; Luke Amend, (316) 343-1933



**Chad's R/C World & Raceway**, 217 Brownie Ave., P.O. Box 76, Scranton, KS 66537; (913) 793-2313



**Ebersole R/C Superspeedway**, 11417 W. Hwy. 54, Wichita, KS 67209; Len Ebersole, (316) 722-8888



**Pittsburg International Mini Speedway**, 511 1/2 N. Locust, Pittsburg, KS 66762; (316) 232-1973



**R/C Superdome & TQ Pro Shop**, 14 E. Ave. A, Hutchinson, KS 67501; (316) 665-6633



**R/C World & Raceway**, 217 Brownie Ave., Scranton, KS 66537; Corry Green, (913) 793-2313



**RCRC Raceway**, 507 N. 4th, Atwood, KS 67730; Bob Dunker, (913) 626-3261

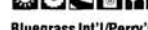


**Shawnee Hobby & R/C Raceway**, 4603 Shawnee Dr., Kansas City, KS 66106; Bill Pugh, (913) 384-3211

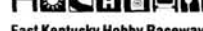


## KENTUCKY

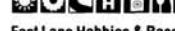
**A&J Raceway**, Hc-64, Box 322-A, Lily, KY 40740; Al Smith, (606) 523-9710



**Bluegrass Int'l/Perry's R/C Hobbies**, 214 Globe St., Radcliff, KY 40160; William Perry, (502) 351-RACE



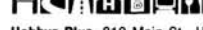
**East Kentucky Hobby Raceway**, Hwy. 15, Garner Mt., Isom, KY 41824; (606) 633-8567



**Fast Lane Hobbies & Raceway**, 281 Porter Pike, Bowling Green, KY 42101; Greg Bailey, (502) 782-2419



**Hobby Center Inc.**, 2106 Triplett St., Owensboro, KY 42303; Bobby Howell, (502) 683-7611



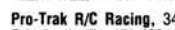
**Hobbys Plus**, 819 Main St., Hazard, KY 41701; Joe Mavaro, (606) 436-3175



**The Lexington Autodrome Raceway**, 2753 Richmond Rd., Lexington, KY 40509; (606) 269-7794



**Lexington Model Shop Raceway**, 211 New Circle Rd., Lexington, KY 40505; Billy Dent, (606) 293-2951



**Pro-Trak R/C Racing**, 3451 Cane Run Rd., Louisville, KY 40211; Les Wurzel, (502) 239-4307



**Remote-Control Hobby Shop/Raceways**, Rt. 8, Box 211, Mayfield, KY 42066; (502) 247-4715



**River Cities Raceworld**, 1104 Powell Ln., Flatwoods, KY 41139; (606) 836-CARS



**Tri-City R/C Raceway**, 1420 Tudor Oaks, Ashland, KY 41102; Eddie Williams, (606) 928-9769



**West Kentucky R/C Cars**, 45 Hawkins Loop, Symsonia, KY 42082; (502) 851-3534



## LOUISIANA

**Acadiana R/C Hobbies & Raceway**, 120 Toledo Dr., Lafayette, LA 70506; (318) 235-5825



**Baha Raceways**, 2225 Hickory Ave., Harahan, LA 70123; Bruce or Dan Rodriguez, (504) 737-6988



**Cajun R/C Raceway**, Rt. 2, Box 288 (Hwy. 343, Bosco) Church Point, LA 70525; Ray Thibodeaux, (318) 873-3855



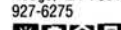
**Cajun R/C Raceway**, 110 A Darbonne, Sulphur, LA 70663; Sandy Thibodeaux, (318) 527-9129



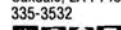
**Johnny V's R/C Hobby & Raceway**, 1036 W. Airline Hwy., LaPlace, LA 70068; Johnny V or Shawn Adams, (504) 651-9045



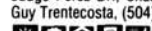
**Loupe's R/C**, 888A Madeline Ct., Baton Rouge, LA 70815; Mark Loupe, (504) 927-6275



**Oakdale Raceway**, 1259 Hwy. 165 S., Oakdale, LA 71463; M.L. Jeziorski, (318) 335-3532



**Performance Hobby Raceway**, 9135 W. Judge Perez Dr., Chalmette, LA 70044; Guy Trentecosta, (504) 271-2468



**Red River R/C**, 3232 East 70th, Shreveport, LA 71105; Pete Bradford or Ken Adcock, (318) 424-6325 or 929-7378



## MAINE

**Central Maine R/C Speedway**, 18 Lithgow St., Winslow, ME 04901; David Prescott, (207) 877-2232



**Clay Bowl R/C Hobbies**, P.O. Box 61, Greene, ME 04236; Pat Cap, (207) 946-5003



**Fast Track R/C Raceway**, P.O. Box 247, Gardiner Rd., Sabattus, ME 04280; Raymond Nadeau, (207) 375-4779



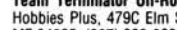
**Mementos Hobby Shop**, 86 Sweden St., Caribou, ME 04736; (207) 498-3711



**Rocket R/C Hobbies**, Annabessacook Rd., Winthrop, ME 04364; (207) 377-6910



**Sanford Speedway**, 479C Elm St., Biddeford, ME 04005; (207) 282-8838



**Team Terminator Off-Road Track**, c/o Hobbys Plus, 479C Elm St., Biddeford, ME 04005; (207) 282-8838





# Track Directory

**40 Speedway**, 933 Pulaski Hwy., Havre de Grace, MD 21078; Doug (410) 538-3135, or Vince, (410) 939-3588



**Friendship Off-Road Racers**, 1531 Florida Ave., Severn, MD 21144; (301) 551-3050



**Fruitland Indoor Race Center**, 203 N. Fruitland Blvd., Fruitland, MD 21826; Thomas Duncan, (410) 543-4329



**GPA Speedway**, 3498 Crain Hwy., Bowie, MD 20715; George Cole, (301) 805-9004



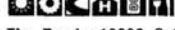
**Maryland RCC Track**, 4201 G.B. Road, Seabrook, MD 30725; James Holes, (410) 322-6125



**Radio Control Cars Inc.**, 13600-A Annapolis, Bowie, MD 20715; Paul Fauth, (301) 262-1444



**Suzie Goose Hobbies**, 718 E. Gude Dr., Rockville, MD 20850; (301) 279-2966



**The Track**, 16806 Oakmont Ave., Gaithersburg, MD 20877; Mimi Wong, (301) 417-9630



## MASSACHUSETTS

**Archer's Lane R/C Raceway**, 118 Washington St. (Rt. 1), S. Attleboro, MA 02730; (508) 399-6762



**C&C Hobby & Raceway**, 562 Russells Mills Rd., S. Dartmouth, MA 02748; (508) 997-4131



**Centerline Hobbies**, 167 Corporation Rd., Hyannis, MA 02601; (508) 771-1244



**CKS Raceway**, 46 Wilbraham St., Palmer, MA 01069; (413) 283-2260



**Julio's Hobby & Speedway**, 825 Main St. (Rt. 109) Milis, MA 02054; (508) 376-1933



**Megadrome Raceway**, N. Adams Plaza, Rt. 8, North Adams, MA 01247; (413) 743-7223



**Mike's Speedway**, Rt. 9, Mt. Farms Mall, Hadley, MA 01035



**Naytrix Raceway**, Holmes Rd., Pittsfield, MA 01201; Rick Welch or Nate Zuckerman (413) 443-2488 or 443-9886



**R/C Hobbies & Speedway**, 1311 Purchase St., New Bedford, MA 02740; (508) 991-5040



**R/C Hobbies & Speedway**, 5628 Reed Rd., N. Dartmouth, MA 02747; Rick Morrisseau or Dave Alfonso, (508) 991-5040



**R/C World Raceway**, 100 Crawford St., Leominster, MA 01453; Dan, (508) 537-9733



**West St. Hobbies**, 114C Main St., Medway, MA 02053; (508) 533-1231



## MICHIGAN

**Baja Bayou Off-Road Raceway**, 5313 W. 22 Mile Rd., Tustin, MI 49688; (616) 829-3447



**Can-Am Hobbies Speedway Park**, 1148 Gratiot, Marysville, MI 48040; (313) 364-3338



**Central Michigan R/C Raceway**, 1270 James Savage, Midland, MI 48640; Mark Siebert, (517) 631-1488



**Cereal City R/C Off-Roaders**, 2000 E. Columbia Ave., Battle Creek, MI 49015; (616) 963-2506



**Chatter Box Racing**, P.O. Box 164, Old State Rd., Central Lake, MI 49622; Bill Allertott, (616) 544-9829



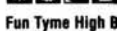
**Dirt Slingers Raceway**, 2460 Edwards, 2460 S. M139, Benton Harbor, MI 49022; Tom Edwards, (616) 927-1431



**DNR Speedways**, 4630 Hill Rd., Harbor Beach, MI 48441; Kelcey, (517) 479-6097



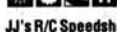
**Doug's Dirt Way**, 5210 Colby Rd., Owassa, MI 48867; Doug Conn, (513) 723-3368



**Fun Tyme High Banked Oval**, Fun Tyme Adventure Park, 6295 E. Saginaw Hwy., Grand Ledge, MI 48837; (517) 655-5503



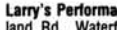
**Harrison International Speedway**, 3519 N. Clare Ave., Harrison, MI 48625; John Starkweather, (517) 539-2921



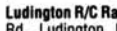
**JJ's R/C Speedshop**, 5645 E. 13 Mile Rd., Warren, MI 48092; (313) 977-0420



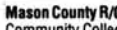
**JT Superspeedway**, 825 Golden Ave., Battle Creek, MI 49017; Jerry or Dan, (616) 965-0571



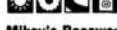
**Larry's Performance R/C's**, 3430 Highland Rd., Waterford, MI 48328; Larry Rossi, (313) 683-5529



**Ludington R/C Raceway**, 1483 N. Dennis Rd., Ludington, MI 49431; (616) 843-4654



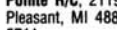
**Mason County R/C Car Track**, West Shore Community College, (611 N. Washington Ave., Ludington, MI 49431) Scottsville, MI 49454; (616) 843-8553 or 843-4837



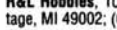
**Mikey's Raceway**, 7 North St., Yale, MI 48097; Mike Huber, (313) 387-4308



**NMRC Raceway**, 110N. Ostego, Gaylord, MI 49735; Ed Schneider, (517) 732-3963



**Pointe R/C**, 2119 Summerton Rd., Mt. Pleasant, MI 48858; Frank, (517) 773-5711



**R&L Hobbies**, 10334 Portage Rd., Portage, MI 49002; (616) 323-3686



**R&S Hobbies & Raceway**, 230 Mill St., St. Louis, MI 48801; Rich Beard or Scott Davis, (517) 681-3463



**Rad & Bad Raceway**, 810 S. Martin Rd., Gladwin, MI 48624; Mick Bushong, (517) 426-4373



**Radio Wave Hobbies**, 14000 Old 14 Mile Rd., Greenville, MI 48838; (616) 754-2170



**Rider's Superspeedway**, 42040 Koppernick, Ste. 400, Canton, MI 48187; Brent Martin, (313) 451-5599



**Rider's Superspeedway**, 4415 S. Westledge, Kalamazoo, MI 49008; Ken Penn, (616) 349-2666



**T/A Raceway**, 119 North Michigan, Big Rapids, MI 49307; Harvey Bailey, (616) 796-3217



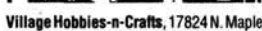
**Thumb Raceway**, 3441 S. Main St., Marlette, MI 48453; (517) 635-7848



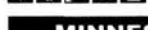
**TNT R/C Raceway**, 130 W. Washington St., Marquette, MI 49855; Gregory Berg, (906) 228-4098



**USA Raceways**, 6803 Dixie Hwy., Bridgeport, MI 48722; (517) 777-7054



**Village Hobbies-n-Crafts**, 17824 N. Maple Island, Hesperia, MI 49421; Alan or Fran, (616) 854-1374



## MINNESOTA

**ABC Raceway**, 120 2nd St. NW, Pipestone, MN 56164; Ross Lange, (507) 825-5065



**C&S Speedway**, 312 N. Broadway, Crookston, MN 56716; (218) 281-6665



**Greater Minnesota Racin' Place**, 3302 Southway Dr., St. Cloud, MN 56301; Jon Jackson, (612) 252-9768



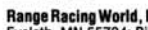
**Mac's Models**, 80 E. Little Canada Rd., Little Canada, MN 55117; Dean Nelson, (612) 482-7796



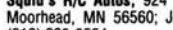
**Minn-E-Golf & Hobby**, 9100 Park Ave., Elk River, MN 55330; (612) 441-8365



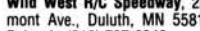
**The PBR Off-Road Rally**, 721 Cedar Ave., Hector, MN 55342; Philip Zempel, (812) 848-2129



**Range Racing World, Inc.**, 412 Jones St., Eveleth, MN 55734; Bill, (218) 744-4423



**Squid's R/C Autos**, 924 Main Avenue, Moorhead, MN 56560; Jeff Greenwell, (218) 233-3554



**Wild West R/C Speedway**, 2822 Piedmont Ave., Duluth, MN 55811; Roger Deloach, (218) 727-6248



## MISSISSIPPI

**Crossroads Raceway**, Mail of Corinth, Rt. 1, Box 1, Corinth, MS 38834; (601) 287-2110



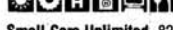
**Dixieland R/C Speedway**, 2535 Tabernacle Rd., Columbus, MS 39702; Jeffrey Alvey, (601) 328-9429



**Fast Freddy's Raceway**, 20390 Hwy. 49, Saucier, MS 39574; Mark Payne, (601) 832-0315



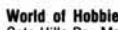
**Norm's R/C Hobbies**, 310 E. Beach Blvd., Long Beach, MS 39560; (601) 863-0524



**Small Cars Unlimited**, 820 Cooper Rd., Jackson, MS 39212; (601) 372-FAST



**Up Front Racing**, 649 Norris St., Greenville, MS 38701; Trey Bordelon, (601) 334-9411 or 378-9201



**World of Hobbies Raceway**, 4909 W. Gate Hills Dr., Meridian, MS 39305; Joe McFaden, (601) 693-8368



## MISSOURI

**All Seasons Hobby**, 152 O'Fallon Plaza, O'Fallon, MO 63366; Bob Daniels, (314) 281-8767



**Doug's Hobbies**, 5221 Veil of Tears, Jefferson City, MO 65109; (314) 893-5861



**Gateway R/C Track & Hobbies**, 255 Marshall Rd., P.O. Box 345, Valley Park, MO 63088; (314) 225-5844



**Harrisonville Hobby Shop & Raceway**, 2301 S. Commercial, Harrisonville, MO 64701; Richard Taylor, (816) 887-3055



**Lafayette Riverside Raceway**, P.O. Box 9663, Marshall Rd., Kirkwood, MO 63122; Don Laningham, (314) 966-8912



**Owensville Raceway**, Hobby Shop & More, 115 N. First St., Owensville, MO 65066; Mike Brune, (314) 764-3461



**Ozark Hobby**, Rt. 6, Box 248-3, Ozark, MO 65721; Deborah Adkisson, (417) 485-4552



**Pevely R/C Raceway**, 2199 Meadow, Barhart, MO 63012; Jerry Benz, (314) 464-8627



**R+ Hobby**, 590 Jungemann Rd., St. Peters, MO 63376; (314) 928-9838



**S&P Performance Shop**, 5383 Highway "N", St. Charles, MO 63304; Paul Lund, (314) 447-5252



**The Track**, Rt. 6, Box 771, Poplar Bluff, MO 63901; Scott, (314) 785-5237 or Bruce, (314) 785-7400



## MONTANA

**Bozeman R/C Powerhouse Track**, west side of the Main Mall, Bozeman, MT 59715; (406) 586-6461



**Garden City Raceway**, 11885 1/2 Hwy. 93, Lolo, MT 59847; Dave Erickson, (406) 273-2776



**Magic City R/C Raceway**, 14th St. W. & Central Ave., Billings, MT 59101; (406) 259-9004



**Pockets Raceway**, Montana State Fairgrounds, Great Falls, MT 59405; Greg Vetter, (406) 761-7279



**Stormer Raceway**, 23 High Speed Road, Glasgow, MT 59230; Mike Stormer, (406) 228-4569



## NEBRASKA

**Hobby Town USA**, 3404 W. 13th St., Grand Island, NE 68801; Ed Conroy, (308) 382-3451



**Over the Wall Gang**, Higiroabee Speedway, 401 Market Pl., Norfolk, NE 68701; Matt Moeller, (402) 379-0879



**The Salvation Army**, 4032 Harrison St., Omaha, NE 68147-1012; Lt. Michael Delashmitt, (402) 634-3414



## NEVADA

**AMS R/C Raceway**, 1130 Icehouse Ave., Sparks, NV 89431; Terry Ramsey, (702) 355-8803



**Fastrax Raceway**, 3218 W. Desert Inn, Las Vegas, NV 89108; Larry or Sue Ashton, (702) 222-0307 or 656-2855

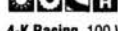


**Little City Hobbies Raceway**, 640 Kuenzki, Reno, NV 89503; shop, (702) 786-3611 or Bill Avery, (702) 358-7629



## NEW HAMPSHIRE

**C.T. Hobbies R/C Raceway**, 49 Eaton Rd., Auburn, NH 03032; (603) 483-2274



**EMC Tracks & Trains**, 1235 Rt. 23 South, Wayne, NJ 07470; (201) 628-4838



**Family Hobbies**, Northwst & Weymouth Rd., Vineland, NJ 08360; Ziggy Tepper, (609) 794-8677



**Glassboro's Grand Oval Speedway**, 167 S. Delsea Dr., Glassboro, NJ 08028; (609) 863-1551



**Golden Hobbies & Crafts**, 415A Erial Rd., Pine Hill, NJ 08021; (609) 782-1222



**Jackson R/C Racing**, Marshall Ave., Jackson, NJ 08527; (908) 905-1593



**LBRA Track**, 392 Warburton Pl., Long Branch, NJ 07740; (908) 222-5122



**Parlor Hobbies**, 34 Broad St., Matawan, NJ 07747; Charlie Roder, (908) 566-3158



**Pit Stop Dragway**, Campus Rd., Totowa, NJ 07512; Kimberly Frank, (201) 942-5955



**Pixley International Speedway**, 763 Peters Dr., P.O. Box 189, Martinsville, NJ 08836; Richard Toole, (908) 560-0399



**The Race Place**, Rt. 33 & 34, Farmingdale, NJ 07727; (908) 938-5215



**Radical Raceway**, 100 Rt. 17S, Lodi, NJ 07727; Lou, (201) 843-6996



**Ricky G's Raceway**, 2208A Hamilton Blvd., South Plainfield, NJ 07080; (908) 753-1518



**S&M Speedway**, 4 Feild Rd., Bedminster, NJ 07921; Lee Spano, (908) 234-2750



**Tri-Oval Speedway & R/C Center**, 296 S. Main St., Phillipsburg, NJ 08865; (908) 454-2223



**Truck Challenge**, 1162 Rt. 202-206 N., Bridgewater, NJ 08807; Michael Gill, (908) 658-9616



**Zepplin Hobbies**, 92 Rt. 23N, Riverdale, NJ 07457; Lou Ballini, (201) 831-7717



## NEW MEXICO

**Cliff Hanger R/C Raceway I**, 1515 E. 20th Space D, Farmington, NM 87401; Butch or Joey, (505) 327-3187



**Cliff Hanger R/C Raceway II**, 2508 Fox St., Farmington, NM 87401; Butch or Joey, (505) 327-3187



**The Pit**, Las Cruces Hobby Raceway, 1996-A S. Valley Dr., Las Cruces, NM 88001; (505) 524-8530



**TRC Race Park**, 1303 E. 8th St., Truth or Consequences, NM 87901; Gary Whitehead, (505) 894-3211



## NEW YORK

**A&D's FastTracks**, 1000 N. Main St., Brewster, NY 10509; (914) 279-2065



**A&S Race Center & Hobbies**, 120 Cayuga St., Canalview Mall, Fulton, NY 13069; (315) 598-2772



**Aldon Speedway**, 100 Castle St., Geneva, NY 14456; (315) 789-8343



**Brockport Speedway**, 6000 Sweden Walker Rd., Brockport, NY 14420; Gil & Betty Glidden, (716) 637-6224



**Cars R/C & Guitars**, 4360 Seneca St., West Seneca, NY 14224; (716) 674-0905



**Capital District R/C Racers**, 27 Venus Dr., Albany, NY 12205; Keith Green, (518) 783-7859



**Catskill Regional R/C Raceway**, Glasco Turnpike, Mt. Marion, NY 12456; (914) 336-5951



**Central New York R/C Auto Racers**, Martin St., P.O. Box 116, Rome, NY 13440; John Orr, (315) 336-5140



**Chipmuck Hill R/C Speedway**, 217 Pine St., Theresa, NY 13961; Ted House, (315) 628-5065



**D&J's Speedway**, 94 Maple St., Croton-on-Hudson, NY 10520; Dan Spatta, (914) 271-5797



**Daytona Miniature Raceway**, 59 Lamar St., W. Babylon, NY 11704; (516) 491-4041



**Dirf Track**, 17 Fairway Dr., Manorville, NY 11949; Billy Wroblewski, (516) 878-0737



**East End Off-Roaders**, Route 25A at Gull's Square, Wading River, NY 11792; (516) 929-8844



**Gamien's R/C Motor Speedway**, 8453 Rt. 11, P.O. Box 1430, Cicero, NY 13039; Dave Wright, (315) 699-2991



**GP Racing**, 6785 Martin St., Rome, NY 13440; Greg Philley, (315) 336-5140



**Island Hobbies & Raceway**, 410 Commack Rd., Deer Park, NY 11729; (516) 254-6229



**HobbyTown USA**, 629 Plank Rd., Clifton Park, NY 12065; Larry Burwell, (518) 383-1215



**Lakeside Raceway & Hobbies**, 712 Wil-low Ave., Ithaca, NY 14850; (607) 272-0248



**Latest Hobbies & Raceway**, Rt. 25A, Wading River, NY 11792; (516) 929-8844



**LI 1/4-Scale Racers**, 63 Horton Dr., Huntington Station, NY 11746; (516) 351-5384



# PROLINE

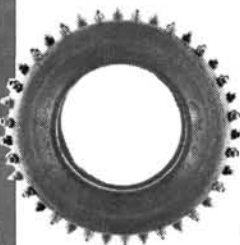
## Pro-Line Introduces New XTR Compound

Released four years ago, Pro-Line's original XT compound was developed as a lightweight, high-performance blend of natural rubber that would offer superior traction on a variety of track conditions. In addition, tires made of this compound lasted much longer than those made of conventional rubber compounds.



Pro-Line was one of the first tire manufacturers to design car and truck tire-tread patterns to suit specific track conditions: the Race Engineered Design (R.E.D.) Series.

Through a subtle reworking of its XT compound, Pro-Line has taken off-road tire technology to the next level of performance, and the result is the new XTR compound. This was developed to provide serious racers with a softer, more pliable tire that will have more "bite" on harder tracks.



## Winning Track Record

Does the new XTR compound work?

Pro-Line's track record proves it does.

At the '92 ROAR Off-Road Nationals, Brian Kinwald used Pro-Line's Pro-80s (the original mini-pin tread design) and Pro-Line's new XTR rubber compound to win the 2WD Modified Class.

On his Yokomo YZ-10, J.D. Beckwith used Pro-Line's new Pro-82, XTR-compound rear "fuzzies" and their new 4WD front "fuzzies" in original compound to win the 4WD Modified National Championship.

As if this weren't enough, Pro-Line tires were used by the winners of every A-Main at the '92 NORRCA Off-Road Nationals!

## New Tread Patterns (in XT compound)

Two new Truck Traction Plus rear tires.

Two new, 2.150-inch 2WD or 4WD car

Traction Plus rear tires.

New 4WD, front "fuzzies."

New 1/8-scale, off-road, spiked tires

(A-Main qualifier at the '92 Kyosho World Challenge).



## Look for the new XTR Compound soon!

The XTR compound will be released in a number of Pro-Line's already available tread designs, including the 2.150 Series and all the tires were developed for hard- to medium-packed conditions. Pro-Line will continue to offer the existing R.E.D. line in the original XT compound.





# Track Directory

**Long Island R/C Club**, P.O. Box 539, Miller Place, NY 11764; John Strahm, (516) 821-2797 or John Kiernan, (516) 821-8923



**Maspeth Raceway**, Rust St. & 57 Rd., Maspeth, NY 11378; Walter, (718) 897-7921



**North Fork Racers**, Jimmy Jon's Hobby House, 7355 Main Rd., Matituck, NY 11952; (516) 298-2020



**Norwood Hobbies Raceway**, 2-4 S. Main St., Norwood, NY 13668; Tom Jarvis, (315) 353-6621



**Performance Hobbies Raceway**, 205 North Ave., Webster, NY 14580; Anthony Cenzi, (716) 621-1274



**Performance Plus R/C Speedway**, The Hobby House, 114 1/2 Jones & Gifford Ave., Jamestown, NY 14701; (716) 488-1772



**Queens Off-Roaders**, 42-12 13th St., Long Island City, NY 11101; (718) 392-5766



**R/C Competition Corner**, K-Mart Plaza, Matitydale, NY 13211; (315) 455-8718



**R/C Hobbies**, Rt. 49, Box 138, Constantia, NY 13044; Roy Catholdi, (315) 623-9536



**R/C Speedway & Hobbies**, 155 State St., Watertown, NY 13601; Steve Pena, (315) 788-1320



**Race O Rama**, 44 Sharon Ave., Plattsburgh, NY 12901; James Varno, (518) 562-5442 or 643-2678



**Raceworld R/C & Hobby**, Budd Rd., Phillipsport, NY 12769; Joe Colombo Jr., (914) 754-7664



**Rampage R/C**, 53-57 Beadart Pl., Hyde Park, NY 12538; Brian Walker, (914) 229-2456



**Rapid Transit Raceway**, 2104 Broadway, Schenectady, NY 12306; Dick Crounse, (518) 372-0777



**Riverside R/C & Hobby**, P.O. Box 125, Rt. 126, Beaver Falls, NY 13305; (315) 346-1682



**Rochester Raceway & Hobby**, 1725 N. Clinton Ave., Rochester, NY 14621; George, (716) 467-2427



**Rock River Model Hobbies**, RD 2, Box 297, Rock River Rd., Interlaken, NY 14847; Carl Schmidt, (607) 532-9489



**Russet's R/C Racetrack**, 1793 Ridge Rd., Ontario, NY 14519; (315) 524-2522



**Schenectady R/C Speedway**, 955 State St., Schenectady, NY 12307; (518) 370-3747



**Schoharie Co. R/C Car Club**, P.O. Box 126, Cobleskill, NY 12043; (518) 234-4600



**Seneca R/C**, 2339 Yerkes Rd., Romulus, NY 14541; (315) 789-8343



**Skaneateles Raceway & Hobby**, P.O. Box 102, Rt. 20, W. Genesee St., Skaneateles, NY 13152; (315) 685-8077



**Small Torque Racers of Long Island**, 24 Horton Dr., Huntington Station, NY 11746; George Franz, (516) 271-1119



**South Shore Hobby & Raceway**, 311 W. Roe Blvd., Patchogue, NY 11772; Don Hauck, (516) 758-5567



**Southern Tier Raceway & Hobbies**, 88 Paige St., Owego, NY 13827; Chet or Anita Harding, (607) 687-5395



**Team Earthquake**, The Hobby House, 114 1/2 Gones & Gifford, Jamestown, NY 14701; (716) 488-1772



**Transit Speedway & Hobbies**, 5319 Transit Rd., Depew, NY 14043; (716) 684-7368



**Wall's Hobby**, 2 Dwight Park Dr., Syracuse, NY 13209; (315) 453-2291



**Western New York R/C Speedway**, 58 Spring St., Cuba, NY 14727; Jason Congdon, (716) 968-3586



**Whitestone Off-Road Raceway**, 149-50 15th Rd., Whitestone, NY 11357; Whitestone Hobbies, (718) 767-6767



## NORTH CAROLINA

**B-n-B R/C Raceway**, 7805 S. Airzona Dr., Raleigh, NC 27604; Craig Barber, (919) 878-8407



**Badin Shore Raceway**, 1730 Jackson Lake Rd., High Point, NC 27263; Jimmy or Tim Martin, (919) 431-9258



**C&H Raceway**, 1400 N. Cannon Blvd., Kannapolis, NC 28083; Camera & Hobby Shop, (704) 933-5321



**Cape Fear Speedway**, 207 Harley Rd., Wilmington, NC 28401; Bob Justice, (919) 762-1184



**Carolina R/C Drag Assoc.**, 907-C Warsaw Rd., Clinton, NC 28328; (919) 592-9489



**Clapp's R/C Motor Speedway**, Rt. 4, Box 300A, Siler City, NC 27344; Al Clapp, (919) 663-3198



**Clinton R/C Raceway**, 907-C Warsaw Rd., Clinton, NC 28328; Corbett Marshburn, (919) 592-9489



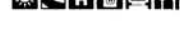
**Dan's R/C Raceway**, Rt. 4, Box 392A, Conover, NC 28613; Danny Dellinger, (704) 256-8963



**Granite City R/C Raceway**, 192-1 N. Main St., Mt. Airy, NC 27030; (919) 786-1466



**Hi-Performance Hobbies & R/C Raceway**, P.O. Box 320, Earl, NC 28038; Derrell Hofffield, Steve Bliss, (704) 482-4391



**Hobbies, Etc.**, 5540 Atlantic Springs, Raleigh, NC 27604; Don Asplen, (919) 790-1444



**Hobby Park**, W. Clemmons Rd., Winston-Salem, NC 27103; Dick Butler, Parks & Recreation, (919) 727-2063



**The Hobby Speedway**, Hwy. 25, P.O. Box 279, Naples, NC 28760; Jerry or Kelda Bowers, (704) 684-9814



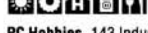
**Joe's Hobby Shop & Raceway**, Rt. 2, Box 682-B, Bessemer City, NC 28016; (704) 435-2912



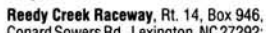
**Motorlead R/C Raceway**, 125 Park St., Canton, NC 28716; (704) 648-7911



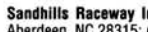
**Mountain R/C Raceway**, Hwy. 107N, P.O. Box 67, Glenville, NC 28736; (704) 743-3709



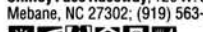
**PC Hobbies**, 143 Industrial Dr., King, NC 27021; Mike Ingles, (919) 983-2514



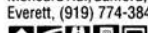
**Reedy Creek Raceway**, Rt. 14, Box 946, Concord Sowers Rd., Lexington, NC 27292; (704) 731-4022



**Sandhills Raceway Inc.** US #1 South, Aberdeen, NC 28315; (919) 944-7414



**Smiley Face Raceway**, 120 W. Center St., Mebane, NC 27302; (919) 563-3822



**Speed Performance**, 4121 Lower Moncur Rd., Sanford, NC 27330; Howard Everett, (919) 774-3843



**TLC R/C Raceway**, Rt. 6, Box 321-A, Hwy. 601, Mocksville, NC 27028; (704) 492-7569



**TNT R/C Raceway**, 707 N. Salisbury Ave., Salisbury, NC 28159; Larry Martin, (704) 633-0647



**Wilkes Hobby Supertrack**, Rt. 1, Box 286-H, Ferguson, NC 28624; (919) 973-3734



## NORTH DAKOTA

**Crystal Springs Off-Road**, 1200 53 Ave. SW, Minot, ND 58701; (701) 852-9590



## OHIO

**AAA Action Speedway**, P.O. Box 6, Morral, OH 43337; Tim McKnight, (614) 465-9891 or Bill Harris, (614) 387-5912



**Aaron's Off-Road R/C Raceway**, 5096 Rt. 127 S., Eaton, OH 45320; Aaron Garrett, (513) 452-1662



**Alcraft's R/C Raceway**, 1370 Custer-Orangeville Rd., Brookfield, OH 44003; (216) 448-1573



**American Raceway**, 234 Robbins Ave., Niles, OH 44446; George Nikoloff, (216) 544-5455



**Bryan Thunderdrome**, Townline Rd., Bryan, OH 43506; Jeff Lehmann, (419) 636-9100



**Classic Hobbies & Raceway**, 2845 W. Waterloo Rd., Akron, OH 44312; (216) 628-3222



**C/R Hobbies Top Race Track**, 4916 Main Ave., Ashtabula, OH 44004; Virginia Gagat, (216) 992-3833



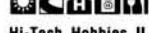
**D&J R/C Raceway**, 801 W. Market St., Orrville, OH 44667; Don Yoder or Mark Nussbaum, (216) 682-4266



**D&S Hobbies Raceway**, 7701 Crile Rd., Concord, OH 44077; (216) 354-2112



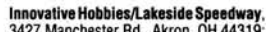
**Golden Bear Hobbies**, 154 N. Millbourne Rd., Orrville, OH 44667; Bob Rodi, (216) 683-1250



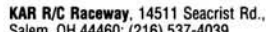
**Hi-Tech Hobbies II**, 116 Taylor St., Loveland, OH 45140; Rick, (513) 683-8900



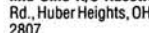
**Hobby Mania Raceway**, 6597 Route 224, Lowellville, OH 44436; (216) 536-8282



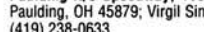
**Innovative Hobbies/Lakeside Speedway**, 3427 Manchester Rd., Akron, OH 44319; (216) 645-1333



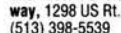
**KAR R/C Raceway**, 14511 Seacrest Rd., Salem, OH 44460; (216) 537-4039



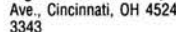
**Mid-Ohio R/C Raceway**, 5367 Fishburg Rd., Huber Heights, OH 45424; (513) 233-2807



**Paulding R/C Speedway**, 103 N. Main, Paulding, OH 45879; Virgil Simindinger, (419) 238-0633



**The Pacer's Choice R/C Hobbies & Raceway**, 1298 US Rt. 42, Mason, OH 45040; (513) 398-5539



**Right Choice Hobbies**, 7760 Garrison Ave., Cincinnati, OH 45247; (513) 353-3343



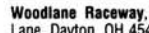
**Strongsville Speedway**, 13315 Prospect, Strongsville, OH 44136; (216) 572-0430



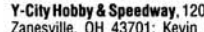
**Trusso's R/C Raceway**, 100 W. Crain Ave., Kent, OH 44240; Bill, (216) 673-0422



**Turn 4 Hobbies**, 112 W. Main St., Van Wert, OH 45891; Virgil, (419) 238-6840



**Way Out Hobbies**, 5583 Centerpoint Rd., Georgetown, OH 45121; (513) 375-4984



**Woodlane Raceway**, 2300 E. Dorothy Lane, Dayton, OH 45420; Jeff Simpson, (513) 298-1166



**Y-City Hobby & Speedway**, 120 S. 6th St., Zanesville, OH 43701; Kevin McKenna, (614) 455-3025



## OKLAHOMA

**Off-Road Car Assoc. of Tulsa**, 1924 W. Pittsburg Ct., Broken Arrow, OK 74012; Mark Seay, (918) 496-8961



**OKC Raceway**, 6707 NW 10th, Oklahoma City, OK, (405) 495-4820



**Wild Country Speedway**, 127 South Main, Porter, OK 74454; Charles McCollough, (918) 483-8111 or 687-1686



**Wings & Things**, 5241 S. Peoria, Tulsa, OK 74105; Dave Hendon, (918) 745-0034



## OREGON

**The Finish Line R/C Raceway**, 560 W. 'D' St., Apt. 6, Creswell, OR 97426; Rod Carothers, (503) 895-4395



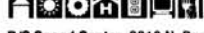
**Mt. Bachelor Radio Raceways**, 225 Centruy Dr., Bend, OR 97701; Rex Baldwin, (503) 389-6160



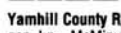
**North Lawrence Raceway**, 36 N. Lawrence, Eugene, OR 97401; Gary Hill, (503) 484-9857



**R/C Plus Hobbies Raceway**, 2029 25th St. SE, Salem, OR 97302-1130; Ron Smith, (503) 364-9188



**R/C Speed Center**, 2810 N. Pacific Hwy., Medford, OR 97501; (503) 779-8298

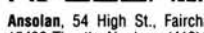


**Yamhill County R/C Car Club**, 722 Morgan Ln., McMinnville, OR 97128; Larry Rucker, (503) 472-7234

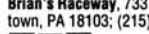


## PENNSYLVANIA

**A-1 R/C Speedway**, 15 S. Hanover St., Hummelstown, PA 17036; Clyde Felker, (717) 566-3335



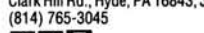
**Ansolan**, 54 High St., Fairchance, PA 15436; Timothy Abraham, (412) 564-9956



**Brian's Raceway**, 733 Flexer Ave., Allentown, PA 18103; (215) 435-1882



**CEB Motors R/C Div.**, 5743 Molly Pitcher Hwy., Marion, PA 17235; Charlie Booze, (717) 375-4635



**Clearfield R/C Car Club**, P.O. Box 297, Clark Hill Rd., Hyde, PA 16843; Joe Welch (814) 765-3045



**Cressona Mall Speedway**, Rt. 61, Pottsville, PA 17901; (717) 385-3506



**Denwick R/C Hobbies & Raceway**, 5601 Lincoln Way East, Fayetteville, PA 17222; Charles Gardenhour, (717) 352-8899



**Dreamboat Hobbies**, 2810 Pennsylvania Ave. W., Warren, PA 16365; Louie Dussia, (814) 723-8052

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**High Tek Hobbies**, 13250 Rt. 30; N. Huntingdon, PA 15642; Ken Brooks, (412) 864-5278



**Hipkins Hobbies Raceway**, 402 W. Avondale-New London, West Grove, PA 19390; Doug Hipkins, (215) 869-8585



**Hobby America Raceway**, 5 Fitzsimmons St., Duke Center, PA 16729; Dan or Mike Coast, (814) 966-3765



**Hobby House Raceway**, Downingtown Marketplace, Downingtown, PA 19335; J.T. Nelson, (215) 269-1300



**Hobby World Raceway**, 172 Shillington Rd., Sinking Spring, PA 19608; Mike Wentzel, (215) 678-8760



**Koontz's Home & Hobby Center**, 1205 Hoover St., Pittsburgh, PA 15204; (412) 331-3866



**L&R R/C Racing**, 15 S. Main St., Red Lion, PA 17356; (717) 244-1108



**Main Hobby Race Center**, 501 E. Lackawanna Ave., Olyphant, PA 18447; Dave or Zig, (717) 489-4566



**Marshall's R/C Raceway**, RR 4, Box 640, Honesdale, PA 18431; Bill or Dot Marshall, (717) 729-7458



**Modellbahn Ott Hobbies**, 1145 E. Philadelphia Ave. (Rt. 73), Gilbertsville, PA 19525; (215) 367-5925



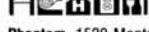
**New Garden Farms/Mushroom Bowl**, 812 W. Cypress St., Kennett Square, PA 19348; Drew Pannell, (215) 444-1850



**Nittany Dirt Racers**, 289 Easterly Pkwy., State College, PA 16801; Mitch Timin, (814) 234-8090



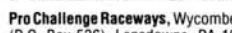
**Performance Hobby**, 1305 Main St., Slatington, PA 18080; (215) 760-9855



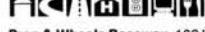
**Phantom**, 1520 Montrose, Philadelphia, PA 19146; (215) 545-3769



**Pit Stop Hobbies**, 262 W. Main St., Mount Joy, PA 17552; James F. Stovot Jr., (717) 653-6222



**Pro Challenge Raceways**, Wycombe Ave. (P.O. Box 536), Lansdowne, PA 19050; Bob Baldwin or Bob Paulauge, (215) 622-7651



**Prop & Wheels Raceway**, 139 W. Broadway, Tamaqua, PA 18252; (717) 668-2288



**R&D Hobbies & Raceway**, 5101-C Jonestown Rd., Harrisburg, PA 17112-2924; Craig Bishop, (717) 545-4984; fax (717) 545-5306



**Race Place Hobbies**, 201 Station Rd., Quakertown, PA 18951; (215) 538-2394



**Radio Controlled Pro Speedway**, Rt. 487N, Stillwater, PA 17878; (717) 387-0266



**Riverside Raceway**, PA Ave. W & Hickory, Warren, PA 16365; Jeff, (814) 723-4211



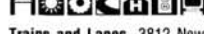
**Rolling Wheels**, West Hills Shopping Center, Coraopolis, PA 15108; Peggy, (412) 262-4858



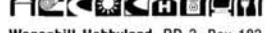
**T&T Radio Controlled Racing**, Randolph Rd., Great Band, PA 18821; (607) 723-9357



**TC's R/C's**, 1537 Freeport Rd., Natrona Heights, PA 15065; Tom Coriale, (412) 226-8802



**Trains and Lanes**, 3812 Newburg Rd., Easton, PA 18042; Jeff Setzer, (215) 253-8850



**Wagonhill Hobbyland**, RD 3, Box 183, Slippery Rock, PA 16057; (412) 458-4711



## RHODE ISLAND

**East Bay Hobbies**, 629 Metacom Ave., Bristol, RI 02809; (401) 254-0778



**R/C Hobbies**, 47 Sandybottom Rd., Coventry, RI 02816; (401) 823-4335



## SOUTH CAROLINA

**Bandits Performance R/C Hobbies**, P.O. Box 1533, Darlington, SC 29532; Bryan Howle Jr., (803) 393-3333



**Berea R/C Speedway**, 707 Sulphur Springs Rd., Greenville, SC 29611; (803) 246-4702



**Capitol City Raceway**, 2712 Le Grand Rd., Columbia, SC 29223; Lee Moulton or Brooks Shealy, (803) 788-7749 or 788-4669



**HMW Hobby Shop & R/C Raceway**, 4930 Dorchester Rd., North Charleston, SC 29418; Brian G. Heath, (803) 760-1578



**Inland R/C Speedway**, 61 Newfound Lane, Myrtle Beach, SC 29577; James Watten, (803) 293-1753



**Mid-Carolina R/C Superspeedway**, 2222 Wintercrest Dr., Rock Hill, SC 29732; Fred Penland, (803) 328-8278



**Monaco's Raceway**, 727 E. Buena Vista Ave., N. Augusta, SC 29841; Bill Lounson, (803) 279-8982



**Palmetto Raceway**, 5023A Rivers Ave., N. Charleston, SC 29418; (803) 566-0068



**R/C Speed Shop & Raceway**, 2122 Platt Springs Rd., W. Columbia, SC 29169; Eric Prevost, (803) 791-4715



**Simpsonville International R/C Speedway**, 3009 Bethel Rd., Simpsonville, SC 29681; Larry Chappellear, (803) 297-3572



**TBS Superspeedway**, 800 Hwy. 15N, Hartsfield, SC 29550; Johnny Tiller, (803) 332-7117



**Thunder Valley R/C Speedway**, 432 E. Church Rd., Easley, SC 29642; (803) 859-2323



## SOUTH DAKOTA

**CSF Speedway**, Central States Fairgrounds, Creative Arts Bldg., 800 San Francisco St., Rapid City, SD 57702; Scoop Laskowski, (605) 342-5292



**Flags of Fun R/C Raceway**, 2802 Eglon St., Rapid City, SD 57702; Rex Conrad or Scoop Caskowski, (605) 341-2186



**Dakota Off-Road Racers**, 2989 W. Br. Co. 12, Aberdeen, SD 57401; (605) 226-0604



## TENNESSEE

**Crash-n-Burn R/C Raceway**, 7030 Maynardville Pike, Knoxville, TN 37918; Gary Daniel, (615) 922-8722



**Competition Park**, Rt. 10, Box 268, Crossville, TN 38555; Terry or Yvette Bowen, (615) 277-5048



**D&M's Downtown Raceway**, 2703 US Hwy. 411S, Maryville, TN 37033; (615) 681-8919



**Lail Speedway**, 812 Wells Rd., Maryville, TN 37801; Jack or Chris, (615) 983-9207



**MSA R/C Racing**, Rt. 12 Box H89 B, Crossville, TN 38555; D.R. Findley, (615) 456-0027



**Raceplace**, 215 Lynn Garden Dr., Kingsport, TN 37660; Randy Horton, (615) 378-3330



**Rivergate Hobby Center**, 700A Two Mile Pkwy., Goodlettsville, TN 37072; David Hitt, (615) 859-3455



**Smitty's Hobbies & Raceway**, 6021 Dayton Blvd., Chatanooga, TN 37415; David Smith, (615) 877-9447



**Tuckasee Off-Road Raceway**, 1104 Lafayette Rd., Clarksville, TN 37042; (615) 645-2635



## TEXAS

**AA Raceway**, 1617 Toomey Rd., Austin, TX 78704; (512) 474-8277



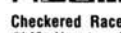
**Anchored Acres Raceway**, 1101 Sheppard Rd., Burkburnett, TX 76354; Bob & Patricia Veal, (817) 569-4707



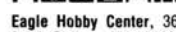
**Austin R/C Center**, 9702 Gray Blvd., Austin, TX 78758; Caton Cobb, (512) 832-8144



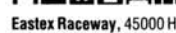
**Budget Raceway**, RR 1, Box 400 I-35, Bruceville, TX 76630; (814) 859-5296



**Checkered Raceway**, 11744 Wilcrest #140, Houston, TX 77099; Rod Ward, (713) 849-3054



**Eagle Hobby Center**, 3601 Shepherd, Balch Springs, TX 75180; Terry Cooke, (214) 557-5290



**Eastex Raceway**, 45000 Hwy. 59 N., New Caney, TX 77357; Heinz Falke, (713) 399-1527



**Hal's R/C Raceway**, 1440 Bessemer, El Paso, TX 79936; (915) 591-2213



**Heart o' Texas Hobbies & Raceway**, 309 W. Hwy. 190, Copperas Cove, TX 76522; Larry Gholson, (817) 547-7505



**Hi-Tech Hobbies & Raceway**, 1107 Port Neches Ave., Port Neches, TX 77651; (409) 724-2315



**Indy R/C World**, 220 Mesquite Village, Mesquite, TX 75150; (214) 686-7744



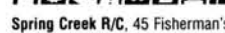
**J&K Speedway**, 201 Enterprise Row, Suite 101, Conroe, TX 77301; J&K Hobbies, (409) 760-1986



**Norm's R/C Hobbies & Raceway**, 2551 Lombardy, Ste. 160, Dallas, TX 75220; Norm Mazzola, (214) 357-3453



**R/C Pro Shop**, 12207 West County Road #129, Odessa, TX 79765



**Spring Creek R/C**, 45 Fisherman's Rd., San Angelo, TX 76904; (915) 944-3850



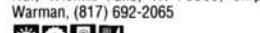
**T&T Eagle**, 161 W. Spring Creek Pkwy., #601, Plano, TX 75023; Tony Welborn, (214) 517-0562



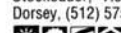
**Texas Speedway**, 6707 Chimney Rock, Bellaire, TX 77401; (713) 661-7137



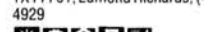
**TK's R/C Park**, 2921 Old Claude Hwy., Amarillo, TX 79101; (806) 622-0017



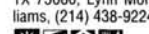
**TSR of Wichita Falls**, 3703 Seymour Rd., Wichita Falls, TX 76309; Chip Warman, (817) 692-2065



**Ty's Toys & Raceway**, 129 John Stockbauer, Victoria, TX 77901; Ty Dorsey, (512) 575-6154



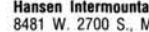
**Wes Hobby**, 980 S. 4th St., Beaumont, TX 77701; Edmond Richards, (409) 839-4929



**Wild Bill's**, 535 E. Shady Grove, Irving, TX 75060; Lynn Morgan or Jerry Williams, (214) 438-9224



**Z Track**, 1550 Dunnam Dr., Abilene, TX 79602; Chi Chi, (915) 692-8477



## UTAH

**Hansen Intermountain R/C Raceway**, 8481 W. 2700 S., Magna, UT 84044; Kevin Hansen, (801) 250-8303



## VERMONT

**Barre Town R/C Club**, Wall St. Complex, S. Main (Rt. 14), Barre, VT 05641; Russ Tribble, (802) 888-2860



**Hard Rock Raceway**, Astrachan Dr., Bennington, VT 05201; Darren Ricchi, (802) 447-2656



**Mike's Hobbies & Raceway**, 162 N. Main St., Rutland, VT 05701; Stephen Rachlis, (802) 775-0059



## VIRGINIA

**A-1 Raceways**, 940 Radford Rd., Christiansburg, VA 24073; Kay or Charles Franks, (703) 381-9731 or 382-1173



**Bob's Hobbies & Raceway**, 910-J Brandy Creek Dr., Mechanicsville, VA 23111; Bob Wagner, (804) 746-2758



**Cooper's R/C Raceway**, Rt. 4, Box 12203, Chatham, VA 24531; (804) 724-4182



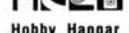
**Crossroads Hobbies R/C Raceway**, 1104 W. Main St., Salem, VA 24153; Ronnie Black, (703) 387-3414



**Front Royal R/C Racing Association**, Chester St., P.O. Box 1252, Front Royal, VA 22630; Roger Stoots, (703) 636-2637



**H&S R/C Raceway**, 565 Electric Rd., Salem, VA 24153; Henry Dowd or Stacy LaPrade, (703) 343-4012



**Hobby Hangar Speedway**, 4433A Brookfield Corp. Dr., Chantilly, VA 22021; Kwang Ko, (703) 631-8820



**KC's Radio Control & Repair**, Rt. 4, Box 312, Trenton Ferry Rd., Lynchburg, VA 24503; Curtis or Kim Wright, (804) 384-8596



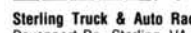
**Lane's End Raceway**, P.O. Box 153, Bridgewater, VA 22812; Tony Strother, (703) 828-6655 or 3471



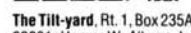
**Mid Atlantic Raceway**, 89 E. Elizabeth St., Harrisburg, VA 22801; (703) 433-3952



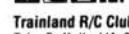
**NSWC MWR R/C Track**, C1243C Dahlgren, VA 22448; Doris Copen, (703) 663-1730



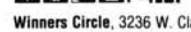
**Sterling Truck & Auto Racers**, 20921 Davenport Dr., Sterling, VA 22170; Ron Beckman, (703) 444-0333



**The Tilt-yard**, Rt. 1, Box 235A, Dayton, VA 22801; Homer W. Allman Jr., (703) 828-3471 or 828-6655



**Trainland R/C Club**, 5661 Shoulders Hill Rd., Suffolk, VA 23435; Frank Stevens, (804) 483-2331

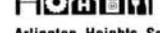


**Winners Circle**, 3236 W. Clay St., Richmond, VA 23230; (804) 355-7076



## WASHINGTON

**Alfie's**, 108 South K St., Aberdeen, WA 98520; (206) 533-6638





# Track Directory

**L&L R/C Raceway**, 15818 SE, 287th, Kent, WA 98042; Eric Lake or Bob Lewis, (206) 639-1241 or 631-1664



**MacDonald R/C Speedway**, 12822 307th Ave. SE, Sultan, WA 98294; Brett MacDonald, (206) 793-1886



**NORA Performance R/C**, P.O. Box 955 (1673 Cedarvale Rd.), Mt. Vernon, WA 98273; (206) 755-9464



**Ryly's Racetrack**, 14810 217th NE, Woodinville, WA 98072; Arva Hudson, 788-4463



**Schmidt's Auto Parts**, 10305 Old Hwy. 99, Marysville, WA 98271; Jon Failla, (206) 653-8838



**Spokane Indoor Raceway**, E. 6422 2nd Ave., Spokane, WA 99212; Mike Gjendern, (509) 534-RACE



**Tacoma R/C Raceway Hobbies**, 6305 6th Ave., Tacoma, WA 98406; (206) 565-1935



**Tearor Raceway**, 8012 S. Tacoma Way, Tacoma, WA 98499; Dave Kleinman, (206) 584-8659



## WEST VIRGINIA

**Fairmont R/C Raceway**, 430 Fairmont St., Fairmont, WV 26554; Ed Kirby, (304) 363-5509



**Fulton's R/C Raceway**, 2646 Chapline St., Wheeling, WV 26003; James Fulton, (304) 233-5355



**R/C Race Place**, Rt. 10, Box 351, Morgantown, WV 26605; (304) 292-0811



## WISCONSIN

**ABCRC**, 1441 B East Main St., Waukesha, WI 53186; Dick, (414) 542-1245



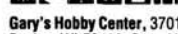
**Arena Park Raceway**, Kenosha County Parks, 7727 60th Ave., Kenosha, WI 53142; David Delabio, (414) 657-6371



**Fox Valley Off-Road Racing Club**, R1, Mayflower Rd., Hortonville, WI 54944; (414) 739-9211



**Frog's R/C Raceway**, Rt. 1, Phillips, WI 54555; (715) 339-2314 or 339-2958



**Gary's Hobby Center**, 3701 Durand Ave., Racine, WI 53403; Ron, (414) 554-8884 or 1-800-894-6229



**Grant County Speedway**, 2125 Oak, Hazel Green, WI 53811; Brad Birkette, (608) 854-2246



**Hobbytown Speedway**, 4231 8th St. S., Wisconsin Rapids, WI 54494; (715) 421-1222



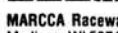
**Hobby World Speedway**, 3198 London Rd., Eau Claire, WI 54701; (715) 834-0456



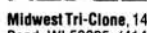
**JJ's Dirt Heaven**, 6028 County K, Champion, WI 54229; (414) 866-9096



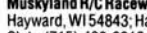
**Maniac Motors Raceway**, 244 Rt. 1 A1 Rt. H, Kendall, WI 54638; (608) 847-4833



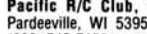
**MARCCA Raceways**, 1810 S. Park St., Madison, WI 53713; Jeff Gundlach, (608) 273-0519



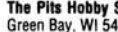
**Midwest Tri-Clone**, 144 N. Main St., West Bend, WI 53095; (414) 334-0487



**Muskyland R/C Raceway**, P.O. Box 1043, Hayward, WI 54843; Hayward R/C Wheels Club, (715) 462-3312



**Pacific R/C Club**, W7990 Hwy. P, Pardeeville, WI 53954; Rhys Brenner, (608) 742-7100



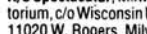
**The Pits Hobby Shop**, 786 Morris Ave., Green Bay, WI 54304; (414) 494-4200



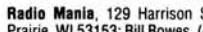
**R/C Hobby Off-Road Track**, Lewison Lane, Viroqua, WI 54665; Dan or Diane Sawvell, (608) 637-8221



**R/C Raceways & Hobbies**, 181 W Marquette Ave., Oak Creek, WI 53154; Ralph & Cathy Augustino, (414) 764-9701



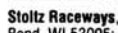
**R/C Spectacular**, Milwaukee Mecca Auditorium, c/o Wisconsin Motorsports Show, 11020 W. Rogers, Milwaukee, WI 53227; (414) 327-3999



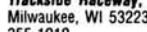
**Radio Mania**, 129 Harrison St., North Prairie, WI 53153; Bill Bowes, (414) 392-9515



**Sparta R/C Raceway**, Golf Course Rd., Sparta, WI 54656; Eric Johnson, (608) 269-5861 or 269-6613



**Stoltz Raceways**, 548 Summit Dr., West Bend, WI 53095; (414) 338-6097



**Trackside Raceway**, 4405 W. Bradley, Milwaukee, WI 53223; Joel Gish, (414) 355-1910



**West Bend Hobbies**, 144 N. Main St., West Bend, WI 53040; (414) 334-0487



## WYOMING

**Collectable Creations Off-Road Oval Track**, 1790 Dell Range Blvd., Cheyenne, WY 82009; Phil Severson, (307) 632-2156



## AUSTRALIA

**Wodonga R/C Car Club**, Willow Park, Wodonga, VIC 3690; Ron Langman, 060-247-128



**Aubry R/C Car Club**, Aubry Showgrounds, Aubry, NSW 2640; Ron Langman, 060-247-128



## BRAZIL

**Hobby Center**, SQS.210 BLH Apt. 204, Brasilia, DF-Brasil 70.273; 061-242-0488



**Off Roaders**, Av. Guillermo Dummont Villars, 317, Sao Paulo, CEP 05640; Waldir Ielpo, (055) 011-260-5628; fax (055) 011-831-4931

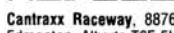


## CANADA

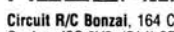
**Aprilia Track**, 20 Parsons Ridge, Kanata, Ontario K2L 2N4; (613) 836-2577



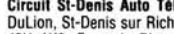
**Autodrome des Prairie**, 935 Boul. St-Luc, St-Luc, Quebec J0J 2A0; (514) 348-0718



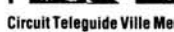
**Cantraxx Raceway**, 8876-48 Ave. SE, Edmonton, Alberta T6E 5L1; (403) 469-9193



**Circuit R/C Bonzal**, 164 Cowie, Granby, Quebec J2G 3V3; (514) 372-3622



**Circuit St-Denis Auto Téléguides**, 292 DuLion, St-Denis sur Richelieu, Quebec, J0H 1K0; Francois Rivard, (514) 787-1127



**Circuit Teleguide Ville Mercier**, 1101 St. Jean Baptiste, Mercier, Quebec J6R 1C6; Norm Foster, (514) 699-4003



**Club AVATT**, 244, rue Hotel de Ville, Deauville, Quebec; Daniel Vanier, (819) 864-6262



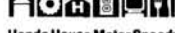
**Crash Course**, Box 9, Site 8, RR #1, Spruce Grove, Alberta T7X 2T4; Tim Starrevied (403) 963-5795



**Dynamic Hobbies**, 21 Concourse Gate, Unit 6, Nepean, Ontario K2E 7S4; Clark Freeman, (613) 225-9634



**GRSCR**, 9 Gauthier, St-de-L'Achigan, Quebec J0K 3H0; (514) 588-4254



**Honda House Motor Speedway**, 384 Richmond St., Chatham, Ontario N7M 1P9; John Elliot, (519) 354-5530



**J-T International Raceway**, 127 Milligan Ln., Napanee, Ontario K7R 8A1; (613) 354-0099



**Krazy Trak**, 2412 Miller Ave., Saskatoon, Sask.; Brian & Bart Kendel, (306) 221-7344



**Quintrax Speedway**, Box 1034, Belleville, Ontario, K8N 5B6; (613) 962-1414; fax: (613) 962-7306



**Radical Raceway**, 150 Bradwick Drive, Unit 25, Concord, Ontario, L4K 1K8; (416) 660-5238



**Rousillon Hobby Track**, 177-D St-Jean Baptiste, Chateaufort, Quebec J6K 3B4; (514) 698-2151



**Seaway Valley R/C Raceway**, RR 1, Iroquois, Ontario K0E 1K0; Orville or Carol Smyth, (613) 652-4953



**Top Qualifier Race Club**, McKay Park, North Vancouver, B.C.; Derrick Vandekraats, (604) 985-3948



**Union Creek Speedway**, 281 Henderson Highway, Winnipeg, Manitoba R2L 1M4; MRCAR c/o Kelvin Community Centre, (204) 667-9186



**Universal R/C Speedway**, Niagara St., Welland, Ontario; (416) 735-5051



## FRANCE

**Auto Electron**, 35, rue B. de Ventadour, Limoges, France 87000; M. Boudoul, 55 062763



## HONDURAS

**Autodromo Accion S.P.S.**, Quinta Santa Maria, San Pedro Sula, Honduras, Colonia Rivera Hernandez; Eduardo Hondal, (504) 52-2061



## JAPAN

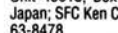
**Iwakuni R/C Raceway**, P.O. Box 1266, FPO AP 96310 Japan; George Mikesell



**Misawa R/C Raceway**, 13th Fighter Squadron, PSC 76, Box 2585, APO AP 96139-2585; 011-81-176-53-5181, ext. 226-6506



**Zama Off-Road Raceway**, 17th ASGCM Unit 45013, Box 3232, APO AP 96338 Japan; SFC Ken Campbell, 011-81-3117-63-8478



## MEXICO

**Jaguar R/C Club**, Calz. Zavaleta 116, Puebla, Mexico 72150; Chema, Denise or Chiro, (22) 31-00-91, (22) 33-00-94



**Hobby's Formula**, Au observatorio 457, Mexico DF 01120; (905) 502-3620



## NEW ZEALAND

**Counties R/C Raceway**, Pukekohe Showgrounds, Station Rd., Pukekohe, New Zealand; R. Northcott, 09 23 86904



## SPAIN

**Outlaw-Ultima II**, Puerto Rico 27, Madrid, Spain 28016; Juan Vacas, (34) 915197298



**ROARCR**, Naval Station, Rota, Spain (P.O. Box 53, FPO NY, NY 09540-0013); PO Kelly Sexton, 011-34-56-822652



## SWITZERLAND

**JMRCV-Terrain du Levant**, Chemin ou Levant, 1290 Versoix, Geneva, Switzerland; fax, 19 41 22 7790805



## VENEZUELA

**Las Fuentes R/C Club**, 2da Calle las Fuentes El Paraiso, Caracas, DF 1020; Franco Agrusa, (02) 461-72 55



## WEST INDIES

**Island Raceway**, 8 Mile Post Jacks Hill, St. Andrew, Jamaica, West Indies; Rodney Littau, (809) 926-7034 or 927-1198



## ZIMBABWE

**Most-Oa-Tunya**, H9619 Highland Harare, Harare Country, Masioraland, Zimbabwe; 46237



# PROLINE TIRES

## On Winning Cars Everywhere!



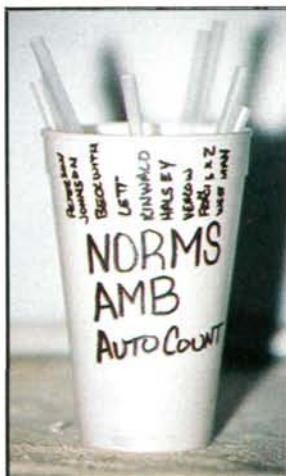
RADIO CONTROL CAR ACTION

# RACER NEWS

WORLD-CLASS RACING



## TRIALS AND TRIBULATIONS IN TEXAS



**Y**ou'd expect that a race of the caliber of the ROAR Off-Road Nats which was held at Norm's Raceway in Dallas, TX, would have a dependable AMB lap-counting system wouldn't you? Well, not so! Unfortunately, many of the racers who attended this event had to rely on the track assistants to han-count their laps when the AMB system failed.

Let's talk about efficiency: Rick Vehlow was on a TQ pace when it was announced over the P.A. system that he had finished. Rick pulled over and stopped, and then the official said "Sorry Rick, you're not done yet." Rick wasn't the only one who had problems with the way things were run. Almost everyone had some disaster story of his own, but we don't have the space to let you in on them. Those of you who attended know what we're talking about. Let's hope that ROAR and race promoters abroad realize that races run like this aren't going to cut it anymore. Our coverage of the Off-Road Nats will appear in the next issue of *Car Action*.

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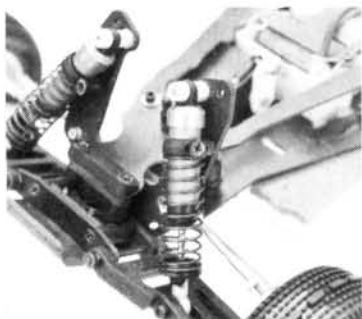




## WHAT'S NEW ON THE TRACK

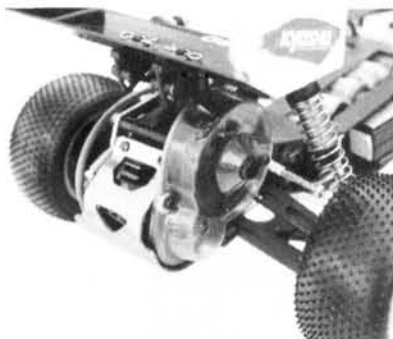
**A**t the recent **ROAR Off-Road Nats** in Dallas, TX, more innovative machinery kept the competition on its toes.

New in the **Kyosho** corner, Chris Walrod of Team Waldo raced what appear to be prototypes of the new-and-improved 2WD **Triumph** and 4WD **Lazer ZX-R**. The Triumph's front end has completely new components: arms, shock tower, bulkhead (with a 30-degree fixed rake angle), caster blocks and a steering system.

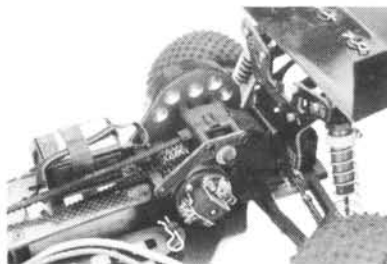


New hard-anodized aluminum **shocks** were tested on both the Triumph and the Lazer. The shocks come with new springs and colored shock caps. A plastic seal at the bottom of the shock body protects it from dirt buildup and shaft scoring.

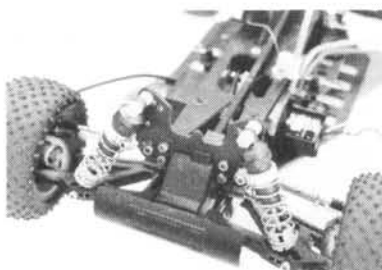
In the rear of the car, a **redesigned transmission** houses a gear-drive setup (it replaces the belt drive) and comes with a ball diff. New A-arms, hub carriers and an improved graphite shock tower complete the picture.



All the redesigned parts are made of a **high-tech material** that's much stronger and less susceptible to breakage than the material that the original Triumph's parts were made of.



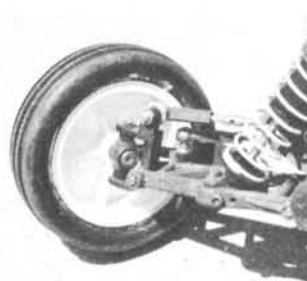
The **Lazer ZX-R** comes with new ball diffs, front and rear graphite shock towers, a new layshaft and new caster blocks. The Lazer has the same shocks as the Triumph.



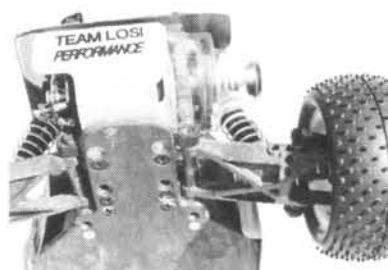
Kyosho plans to introduce a gear-drive transmission that will be similar to Associated's **Stealth** transmission.

**Traxxas** finished strong at the Nats with Rick Vehlow piloting the prototype fiberglass-chassis, 2WD **TRX-1**. Rick took the top honors in the Stock Class after battling with Team Losi's Kyle Reed throughout the event.

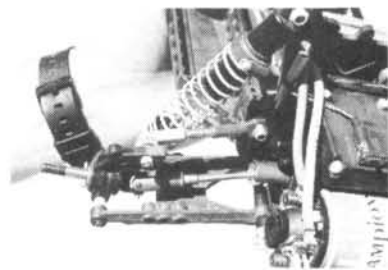
While strolling through the **Losi** pit area, we happened to notice a few mods that 2WD Modified Class TQ Jack Johnson had made to his **Pro SE**. He changed the front camber-mounting position by installing **LX-T** front hub carriers and a new shock tower with different camber-rod positions. According to Jack, this change helps the car steer with more of a radius around turns instead of "squaring off" and scrubbing speed. It's rumored that Losi's **Jammin' Products** line will soon offer the **"Steering-Enhancement Kit"** (part no. J550). It will sell for just \$12.95, and it will include the updated shock tower, spindles and carriers, and all the mounting hardware that you'll need.



In the rear of the car, protective spacers over the suspension arms' inner hinge pins prevent them from binding when the suspension bottoms out over big jumps.



The Losi boys have also experimented quite a lot with **roll-center adjustment** by changing the rear camber rod's position. The position shown in the photo seemed to work particularly well on the slick track surface at Norm's, and it gave a proper balance between rear traction and front steering.



The cars we saw at the Texas Nats were all, in a way, the basis for upcoming production models. We hope we'll see them on the shelves soon. We'll keep you posted.

## ALL I WANT FOR CHRISTMAS IS...

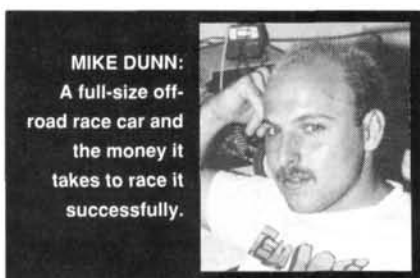
In pursuit of journalistic excellence, we bring you the top drivers' Christmas wish lists! That's right, we rounded them up and asked them what their ideal Christmas presents would be. So, if you want to kiss up to the big guys, keep these things in mind:



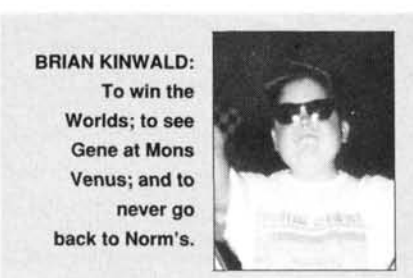
**JACK JOHNSON:**  
A Honda Pilot  
(off-road vehicle)  
and a three-  
month vacation  
in the Caribbean.



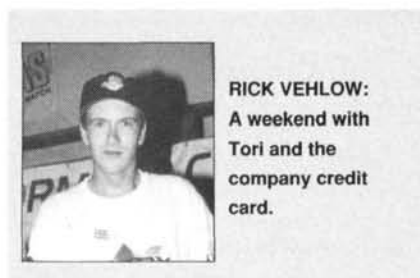
**JAY HALSEY:**  
I'd like my two front  
teeth, a Laeger  
custom swingarm for  
my Yamaha Banshee,  
and for all my family  
and friends to stay  
healthy.



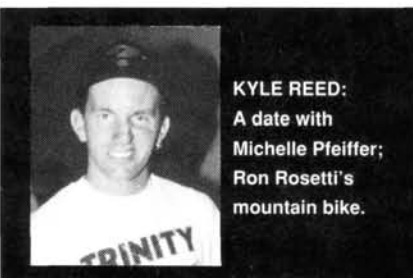
**MIKE DUNN:**  
A full-size off-  
road race car and  
the money it  
takes to race it  
successfully.



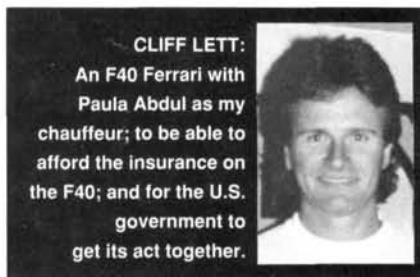
**BRIAN KINWALD:**  
To win the  
Worlds; to see  
Gene at Mons  
Venus; and to  
never go  
back to Norm's.



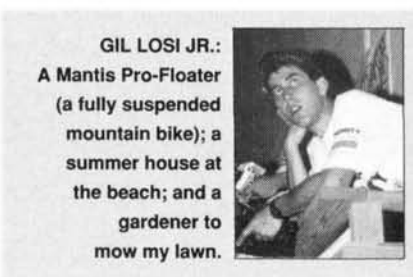
**RICK VEHLow:**  
A weekend with  
Tori and the  
company credit  
card.



**KYLE REED:**  
A date with  
Michelle Pfeiffer;  
Ron Rosetti's  
mountain bike.



**CLIFF LETT:**  
An F40 Ferrari with  
Paula Abdul as my  
chauffeur; to be able to  
afford the insurance on  
the F40; and for the U.S.  
government to  
get its act together.



**GIL LOSI JR.:**  
A Mantis Pro-Floater  
(a fully suspended  
mountain bike); a  
summer house at  
the beach; and a  
gardener to  
mow my lawn.



### NOVAK NEWS

**N**ovak Electronics conducts ongoing tests that help them to offer their customers and racers the best possible equipment at all times. During one test session, they found that after adding another recirculation diode—a Schottky diode—across the motor brushes, the speed controller's brake circuitry generated less heat. This allowed more consistent braking action during the whole race. Knowing this, Novak took enough recirculation diodes to the recent Off-Road Nats in Texas to supply them to anyone who had a Novak speed controller. The results were so overwhelming that Novak has decided to add this diode to its accessory line and make it available to everyone.



### IT'S OFFICIAL!

Recently, you've read about Joel Johnson's winning Trinity car, the ReFlex 10 Road Car. Well, folks, the prototype has a real name now, and it is...(drum roll, please!) the **Evolution 10!** This compact, lightweight, high-tech car stole the show as Joel won all three main events at the IFMAR World Championship in Pomona, CA. Look for a production model to grace the pages of *Car Action* very soon.

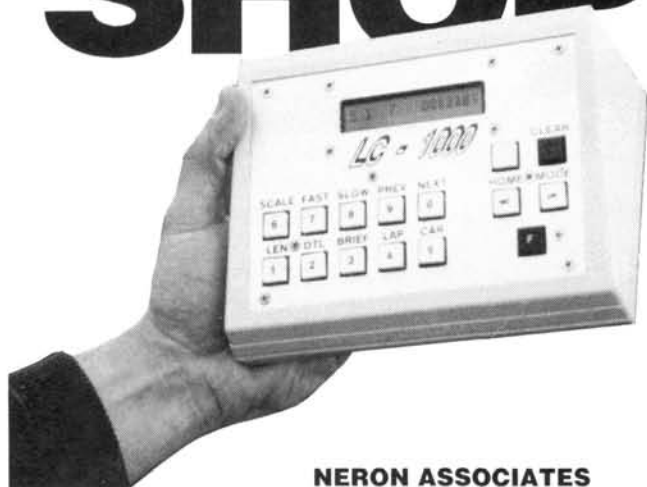


RACER



NEWS

# SPEED SHOP



## NERON ASSOCIATES LC-1000 Jr. Lap-Counting System

This new lap-counting system can keep tabs on up to five cars at a time and can be upgraded to accommodate as many as 10 cars. It accepts Neron's wired remote push-buttons, and there's an optional printer. Race action is reported in lead-car order, total laps, elapsed time, fastest/slowest laps and scale/actual mph. It has a countdown clock and a tone to mark the start and finish. It's powered by a 7.2V battery pack.

Part no. LC-1000JR

Price: \$395

Neron Associates, P.O. Box 348, Germantown, MD 20875; (301) 972-0397.



## C&M TEAM COBRA Stock Com 2000K

This light, portable lathe cuts stock motors accurately and cleanly, and when you use it, you don't have to take the armature out of the motor can. It improves motor performance substantially and makes stock motors last three to five times longer. This sturdy, black- and gold-anodized lathe has Teflon shims for smooth operation, and it comes with a high-quality carbide bit. A diamond bit is also available.

Price: \$219.95

C&M Team Cobra, P.O. Box 701-353, West Valley City, UT 84170; (801) 250-9747.

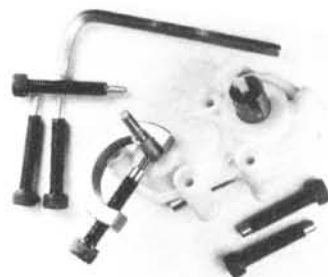
## THORP MFG. Roll Pin Installer

With this new tool, you'll be able to install 1/16-, 5/64- and 3/32-inch roll pins with ease. It also makes it easier to install the roll pin in the slipper clutch of your Stealth tranny.

Part no. 2002

Price: \$25

Thorp Mfg. Inc.,  
4054 E. Mission Blvd.,  
Pomona, CA 91766;  
(714) 622-6518.



## TEAM LOSI Simplified Springs

Team Losi has modified its popular line of springs to simplify selection and identification. The expanded line now lists all springs by their length, rate and color. The springs also have ground ends for consistent operation, and brilliant, colorful, corrosion-resistant powder coats for ease of identification. They're available in 1.5-, 2- and 2.5-inch lengths.

Team Losi, 13848 Magnolia Ave., Chino, CA 91710; (714) 465-9728.





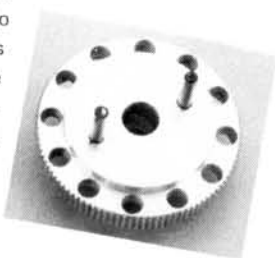
### **KYOSHO/ DURATRAX Inferno Brake Disk and Light Flywheel**

From Kyosho and Duratrax come two accessories that improve the Inferno's performance. The BSW-52 fiber brake disk lasts longer and offers greater braking power than the stock brake disk, and it keeps brake dust to a minimum. The flywheel is machined and drilled to reduce weight and increase acceleration—great for short tracks with lots of sharp turns.

Part nos.: KYOC2591 (brake disk); DTXG2500 (flywheel).

Prices: \$22.95; \$39.95.

Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826; (217) 398-3630.

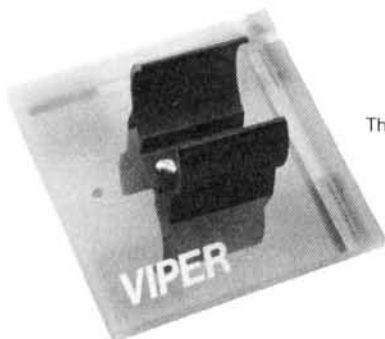
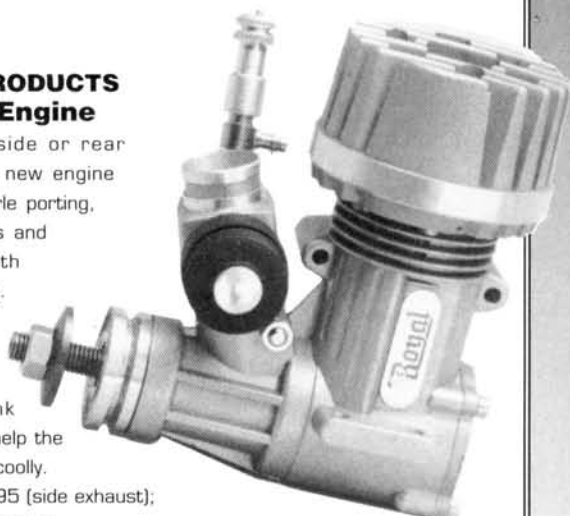


### **ROYAL PRODUCTS .21 Car Engine**

Available with side or rear exhaust, Royal's new engine has ABC Schnuerle porting, twin ball bearings and a carburetor with full fuel metering. It uses the same mounts as an O.S. .21, and it has a heat-sink cylinder head to help the engine run more coolly.

Prices: \$127.95 (side exhaust); \$131.95 (rear exhaust).

Royal Products, 790 W. Tennessee Ave., Denver, CO 80223; (303) 778-7711.



### **VIPER RACING PRODUCTS Motor Clamp**

The strong Motor Clamp holds motors in place securely. Its adjustable mounts enable you to use cooling fans of different sizes, and its heat-resistant base has brush-cutting grooves that will hold the brush firmly and allow you to cut precisely time after time.

Part no. VRP 4000

Price: \$6.99

Viper Racing Products, P.O. Box 122, Thornwood, NY 10594; (914) 769-1486.

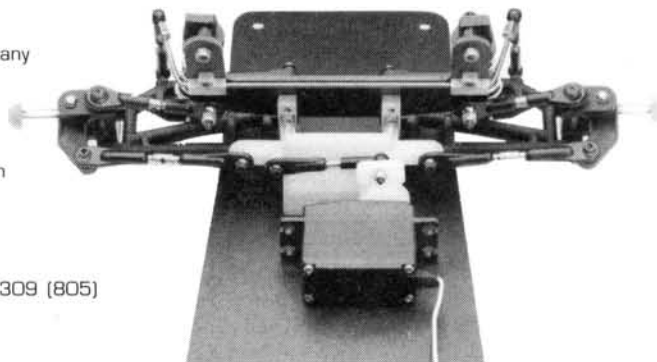
### **CUSTOM WORKS Steering Rack**

The Custom Works steering rack can be used with virtually any chassis in the industry! This ultralight unit works without lubrication and has none of the slop that's usual with conventional drag-link systems. The rack is compatible with servos of all sizes and is designed for use with the Custom Works tie-rod set (no. 5214).

Part no. 3207

Price: \$12

Custom Works, 3720 Easton Dr. #7, Bakersfield, CA 93309 (805) 323-0471.



*Descriptions of the products shown on these pages were derived from press releases supplied by manufacturers and/or their advertising agencies. The information given is neither an endorsement of the product by Radio Control Car Action, nor a guarantee of performance or safety. If you write to the manufacturer about any product described here, be sure to say that you read about it in Radio Control Car Action.*



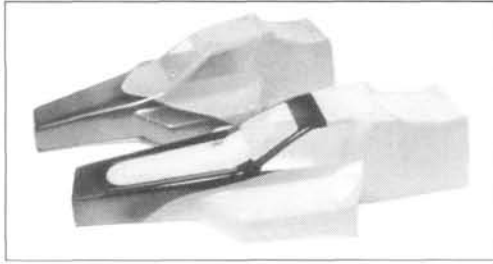
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Offroad bodies are used by the top racers  
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| ADC, TRUE TURN, BUDS, PSE—IN STOCK.....  | SAVE \$\$ |
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| CONVERSION (H10RS).....                  | 99.95     |
| HYPERDRIVE/PROTO-FORM BODIES.....        | 14.50     |
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| HYPERDRIVE H10RS. NARROW.....            | 197.50    |
| HYPERDRIVE H10RS CHASSIS CONVERSION..... | 76.49     |
| LYNX SS GROUND-EFFECTS                   |           |
| NARROW GRAPHITE CHASSIS.....             | 55.95     |

|                                            |            |
|--------------------------------------------|------------|
| LYNX II SUPERSPEEDWAY CONVERSION           |            |
| KIT WITH GROUND-EFFECTS CHASSIS.....       | 119.95     |
| LYNX GRAPHITE BUMPER.....                  | 15.95      |
| TRC 1/10TH T/M PRO RADIALS - FRONTS.....   | 12.25 ea.  |
| TRC 1/10TH T/M PRO RADIALS - REARS.....    | 13.60 ea.  |
| ANDY'S BODY'S T-BIRD, LUMINA, PONTIAC..... | 13.50      |
| NEW TRC T-BIRD BODY.....                   | 14.00      |
| TRC FOAM TIRES—BLUE & GREEN COMPOUNDS      |            |
| 1/10-SCALE FRONTS.....                     | 10.95 pair |
| 1/10-SCALE REARS.....                      | 12.95 pair |

PCHobbies, 143 Industrial Drive,  
King, NC 27021 Tel: (919) 983-2514  
Tues., Wed. 9-5; Thurs., Fri. Sat. 12-9

## LETTERS

(Continued from page 112)

### FIRST THINGS FIRST

I'm a 15-year-old R/C enthusiast, and I need help choosing a first truck. I want a relatively inexpensive, semi-speedy race truck. My dad owns a Traxxas Sledgehammer, and I like that, but I want more speed and little maintenance. A ready-to-run truck would be ideal.

After I've chosen and bought my truck, where do I go from there? What type of charger do I need? Which would be most efficient? Which transmitter is best for a newcomer? And should I upgrade? And if I do, how? Finally, do all car bodies fit any car that's the same scale (1/10 or 1/12)? I'd appreciate any help you can give.

JOE PHILLIPS  
Cedar Park, TX

*Joe, the Sledgehammer is more of a "backyard basher" than a racing truck. You can make it more competitive, but you'd have to make a lot of modifications and spend mo' money. You say that a ready-to-run truck would be ideal. Traxxas offers the Hawk 2 ready to run. It's an excellent beginners' truck and a step above the Sledgehammer. You could modify the Hawk 2 much more easily than you could modify a*

(Continued on page 180)

# Attention track owners!

**free!**

We've updated and expanded our Track Directory, and you can get in on the action! Please fill out this coupon, and be sure the information is

accurate and complete. If you have more than one track at your facility, use a separate form for each one. Remember, it's free!

TRACK NAME \_\_\_\_\_

CONTACT \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_

ZIP \_\_\_\_\_

PHONE (REQ'D.) ( ) \_\_\_\_\_

Track area: \_\_\_\_\_ x \_\_\_\_\_ feet (length x width)

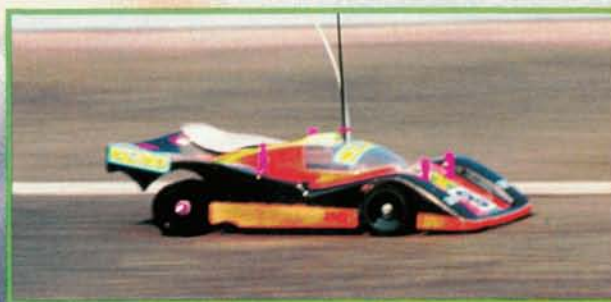
(Check all that apply)

- |                                   |                                                 |
|-----------------------------------|-------------------------------------------------|
| <input type="checkbox"/> Indoor   | <input type="checkbox"/> Concrete               |
| <input type="checkbox"/> Outdoor  | <input type="checkbox"/> Asphalt                |
| <input type="checkbox"/> Off-road | <input type="checkbox"/> On-site hobby shop     |
| <input type="checkbox"/> Oval     | <input type="checkbox"/> AC power               |
| <input type="checkbox"/> Banked   | <input type="checkbox"/> Automatic lap-counting |
| <input type="checkbox"/> Dirt     | <input type="checkbox"/> Food available         |
| <input type="checkbox"/> Carpet   | <input type="checkbox"/> Handicap access        |

Return to Track Directory, Radio Control Car Action, 251 Danbury Road, Wilton, CT 06897







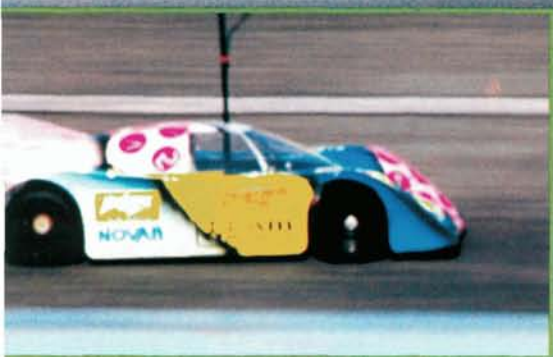
*Racers ready....*

*Sappy stylin'! The "winning" combo of a twitchy trigger finger and too much traction results in a less-than-desirable flip. When the track surface was dry, traction was always easy to find.*



*ROAR ON-ROAD*



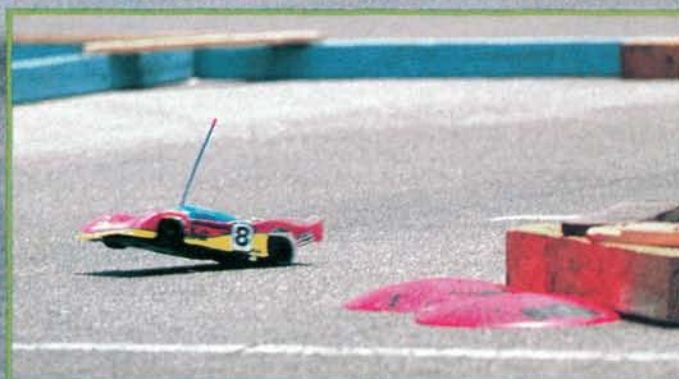


Orlando, Florida, was the scene of the '92 ROAR On-Road Nats, but unfortunately, the races were often interrupted by torrential rainstorms. The inclement weather didn't spoil the attitudes of the 280 entrants, however, when it came to getting down and providing some intense racing action.

by JOHN HUBER

**T**he world's best racers journeyed to sunny Florida in June to battle in the 1992 ROAR On-Road Nats. Well, it was sunny most of the time...OK: except for the brief thunderstorms each day, the sun was out in full force—so were the racers. The race, which was held on June 19, 20 and 21, attracted 280 entrants—40 in 1/12-Scale Stock, 60 in 1/12-Scale Modified, 100 in 1/10-Scale Stock and 80 in 1/10-Scale Modified.

This year's Nate was sponsored by PTI/Hyperdrive, Associated, Rainbow Riders, Parma/PSE, Boca Bearings, TRC and the Orlando Penta Hotel, and many others donated prizes. Race director Bill Pinch tried to make sure that things were on schedule, but he couldn't control the weather! Several ROAR race officials were also present to make sure the event ran smoothly: Bill Fraden (Region IV director), Gene Husting (vice president), Skip Starkey



*On-Road Nats*

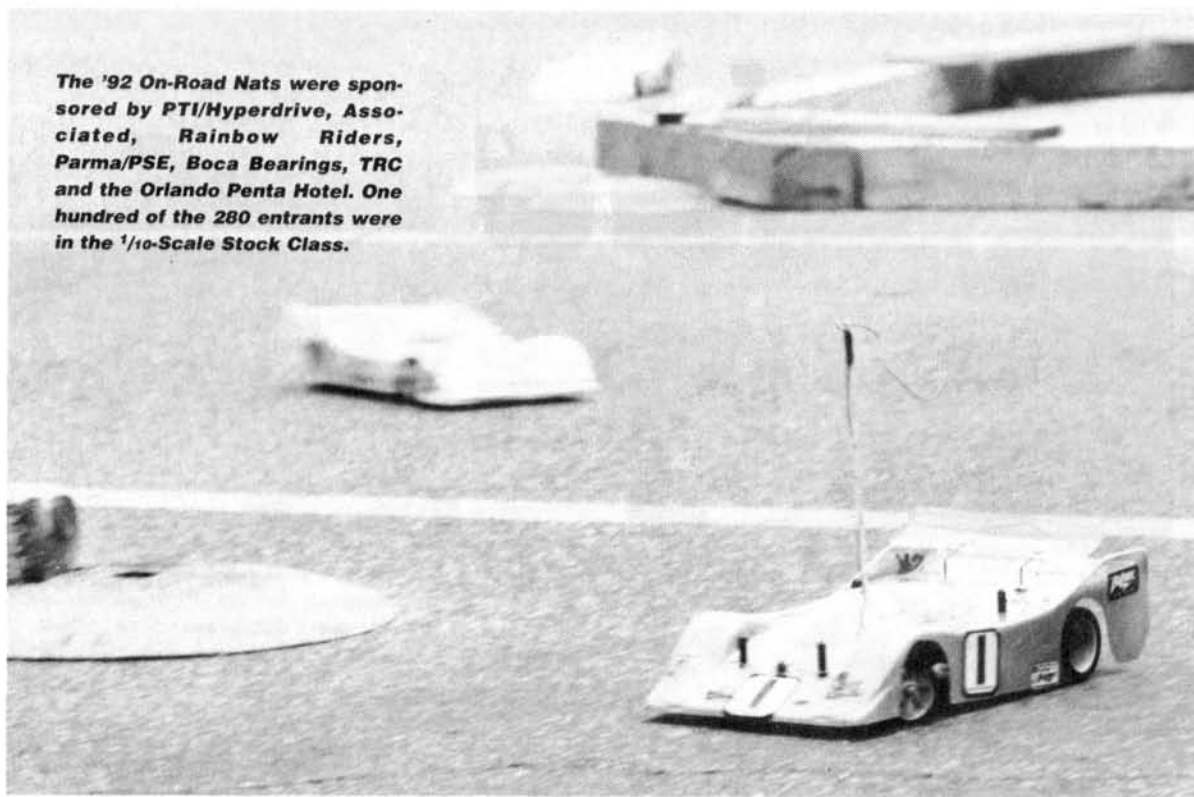


(1/10-scale on-road director), Jim Fuller (1/10-scale paved oval director), Bill Jero (1/12-scale on-road director) and Steve Whitney (national administrator).

PHOTOS BY JOHN HUBER



The '92 On-Road Nats were sponsored by PTI/Hyperdrive, Associated, Rainbow Riders, Parma/PSE, Boca Bearings, TRC and the Orlando Penta Hotel. One hundred of the 280 entrants were in the 1/10-Scale Stock Class.



# ROAR ON- road nats

## THE TRACK

The track was set up in the parking lot of the hotel, and I was completely psyched that my seventh-floor room overlooked it. Racers were encouraged to pit in their rooms (in the A/C) and could keep track of the races and the heats by tuning in to a channel on the hotel's TV system.

Because the track wasn't the smoothest one any of us had ever raced on, it challenged most drivers. After it had been cleaned and lightly coated with sugar water, it was actually pretty good. During qualifiers, an IFMAR-type start sent the drivers out one at a time. The cars started in front of the computer tent and ran down a short straight and into a 180-degree right turn, followed by a 180-degree turn to the left. They headed down a short straight and a left turn that started a series of S-turns that led them to the back straight. At the end of the straight was a tight right/left/right combo that took them around to the start/finish line.

## QUALIFYING

There were two rounds of qualifying Friday and two on Saturday. Except for the weather, everything went smoothly.

In 1/12-Scale Stock, Greg Klugh sat on the pole with Brian Curtis and Shawn Rayfield right behind him. Klugh also TQed in the 1/10-Scale Stock Class! Following him there were Tim LeClair and Janien Gill.

The 1/12-Scale Modified Class was full of familiar faces. Trinity's Joel Johnson was the TQ followed by Associated's Tony Neisinger and Mike Blackstock. Eight of the cars in

the A-Main were 12LWs. The other two racers—Frank Calandra of Team Class and Jon Orr of Twister—drove Corallys.

In the 1/10-Scale Modified Class, Tyree Phillips of Novak Electronics TQed. Behind him were Blackstock and Hyperdrive's Ralph Burch. Johnson, in fourth place, was still in the hunt.

## THE A-MAINS

• **1/12-Scale Stock.** At the sound of the horn, Klugh shot into the lead followed by Kevin McIntyre and Everett Pietras. Klugh ran clean laps that averaged around 15.3 seconds, but so did Ray-

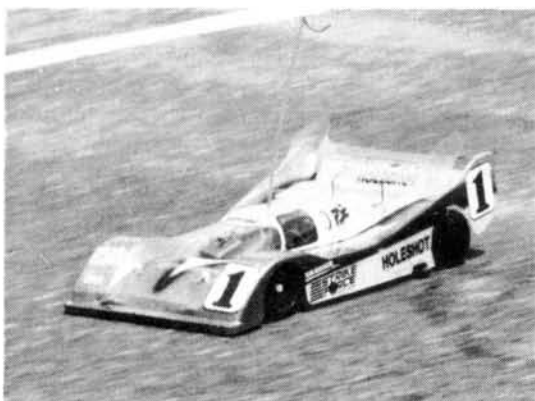
field, who was in the 4th spot. At the 2-minute mark, Rayfield took 3rd behind McIntyre and Klugh, where he stayed, fending off a hard charge by Scott Schilke at the 5-minute mark. Those three held the top spots, and that's how it finished: Klugh, McIntyre, Rayfield.

• **1/12-Scale Modified.** At the start, 4th qualifier Terry Rott shot into the lead,

followed by Chris Doseck, Johnson and Blackstock. With 1:24 down, Johnson moved up to the 2nd spot, putting Doseck a place down. At the 2-minute mark, Joel moved into the lead followed by Rott and Doseck. Doseck, Kevin Jelich, Blackstock, and Neisinger were all fighting for 3rd. By the 4-minute mark, Neisinger had captured 3rd and Jelich was out of the race. Blackstock and Doseck battled for 4th behind Johnson, Rott, and Neisinger. Neisinger dropped back to 6th, and as they crossed the finish line, Johnson was followed by Rott, Blackstock and Doseck.

• **1/10-Scale Stock.** Klugh may have TQed by 2 seconds, but at the start of the race he was *hammered*. The crowd went wild as Orlando's Mike Spehn took the early lead followed by Pietras, Frank Trinchitella and Steve Whitney. By the 2-minute mark, Klugh had recovered and was in 1st again, this time to stay. Pietras hung onto 2nd, trailed by Trinchitella and Whitney. With such consistency and skill, Klugh is bound to be a familiar face in the winners' circle.

• **1/10-Scale Modified.** At the tone, all 10 cars shot for the lead.

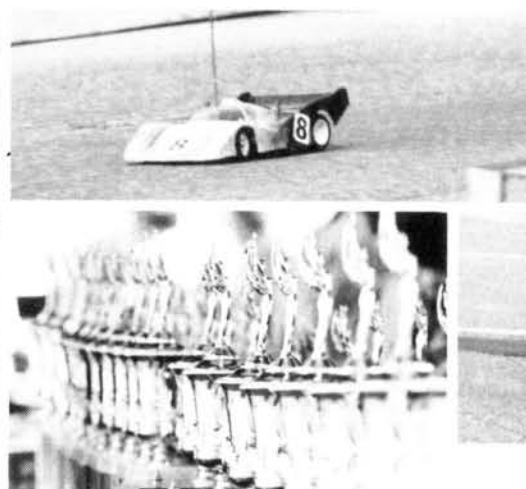


During the course of the event, the surface of the track had to be treated more than a dozen times. A big thanks goes to "Team Sugar" (Scott Schilke, Steve Lawson and Jim Cukla) for keeping the track race-ready.

# ROAR ON- road nats



Racers who stayed at the nearby Penta Hotel could keep track of the races and heats by tuning in to a channel on the hotel's TV system.



Everyone's goal! Usually sunny Orlando hosted this year's On-Road Nats, but, unfortunately for the participants, the weather didn't cooperate.

As I shot photos of the cars entering turn one, I saw a car fly off the track and into the crowd. It belonged to none other than Joel Johnson. As the cars crossed the line for lap one, Blackstock was in the lead, and Johnson was in last place, but coming on hard. Phillips was in the second spot with Bob Horan in third. Phillips dropped back and let Horan take the second spot with Willie Decker, Rott, Neisinger and Johnson following. At the 2:45 mark, Blackstock dropped out

and Joel shot into the lead followed by Rott and Horan. Rott fought hard to catch Johnson, but had to settle for 2nd and Horan held on for 3rd. All in all, this was one of the best races I've ever seen—hands down. When I saw Joel's car fly off the track at the first turn, I thought there was no way that he could fight his way back to first; I guess that's why they call him "Magic."

What a weekend! It's interesting that only two racers picked up four national titles. Greg Klugh's driving was flawless. As for Joel, well he *is* the Magic Man, once again. Not many racers can come back from the back of the pack to take the win, but he sure did.

Thanks again to all the sponsors and officials who helped to make this year's Nats a success. Let's hope next year's Nats is a *dry* one! ■

## 1/12-SCALE STOCK

| Fin | Qual | Name            | Chassis           |
|-----|------|-----------------|-------------------|
| 1   | 1    | Greg Klugh      | Corally SP12G     |
| 2   | 6    | Kevin McIntyre  | Associated 12LW   |
| 3   | 3    | Shawn Rayfield  | TRC Mini Lynx     |
| 4   | 8    | Scott Schilke   | Associated 12L    |
| 5   | 9    | Chad Kruggel    | Associated 12LW   |
| 6   | 5    | Everett Pietras | Corally SP12G     |
| 7   | 2    | Brian Curtis    | Associated 12LW   |
| 8   | 10   | Kevin Clark     |                   |
| 9   | 7    | Patrick Miller  | Bolink            |
| DNS | 4    | Mike Wood Jr.   | Wood Exterminator |

| Motor | ESC        | Batteries         |
|-------|------------|-------------------|
| H     | Novak M1c  | Bullet/East Coast |
| A     | Tekin 411G | Team Smooth       |
| N     | Novak      | East Coast        |
| D     | Novak      | Team Smooth       |
| O     | Tekin 610  | PTI               |
| U     | Tekin 411P | New Wave          |
| T     | Novak      | Max Cell          |
|       | n/a        | n/a               |
|       | Tekin      | PTI               |
|       | Tekin 411P | Fantom            |

## 1/12-SCALE MODIFIED

| Fin | Qual | Name            | Chassis         |
|-----|------|-----------------|-----------------|
| 1   | 1    | Joel Johnson    | CompCraft 12LW  |
| 2   | 4    | Terry Rott      | Associated 12LW |
| 3   | 3    | Mike Blackstock | Associated 12LW |
| 4   | 5    | Chris Doseck    | Associated 12LW |
| 5   | 7    | Wayne Gerber    | Associated 12LW |
| 6   | 2    | Tony Neisinger  | Associated 12LW |
| 7   | 10   | Steve Radecky   | Associated 12LW |
| 8   | 6    | Kevin Jelich    | Associated 12LW |
| 9   | 8    | Frank Calandra  | Corally SP12G   |
| 10  | 9    | John Orr        | Corally SP12G   |

| Motor       | ESC        | Batteries      |
|-------------|------------|----------------|
| Trinity     | Novak HPC  | Trinity Pushed |
| East Coast  | Novak HPC  | Panasonic      |
| Reedy Mr. B | Novak HPC  | Stage III      |
| CAM         | Tekin 410K | Team Arlington |
| PSE         | Novak M5   | Max Cell       |
| Reedy       | Novak      | Max Cell       |
| Bud's       | Novak      | Power Push     |
| Peak Perf.  | Novak M5   | Team Orion     |
| Trinity     | Novak M1   | Trinity Pushed |
| Twister     | Novak      | Team Arlington |

## 1/10-SCALE STOCK

| Fin | Qual | Name               | Chassis          |
|-----|------|--------------------|------------------|
| 1   | 1    | Greg Klugh         | Corally SP10G    |
| 2   | 4    | Everett Pietras    | Corally SP10G    |
| 3   | 6    | Frank Trinchitella | Associated RC10L |
| 4   | 5    | Steve Whitney      | Associated RC10L |
| 5   | 2    | Tim LeClair        | Associated RC10L |
| 6   | 10   | Steve Boice        | Wood XJ-10       |
| 7   | 3    | Janien Gill        | Associated RC10L |
| 8   | 7    | Mike Spehn         | Associated RC10L |
| 9   | 8    | Shawn Rayfield     | TRC Lynx II      |
| 10  | 9    | Mike Pecchio       | Associated RC10L |

| Motor | ESC        | Batteries         |
|-------|------------|-------------------|
| H     | Tekin 410K | Bullet/East Coast |
| A     | Tekin 411P | New Wave          |
| N     | Novak      | Killer Cells      |
| D     | Novak      | Team Smooth       |
| O     | Tekin 411G | Max-Cell          |
| U     | Tekin 411P | Advantage         |
| T     | Novak MXc  | Team Smooth       |
|       | Novak M1c  | Magnum            |
|       | Tekin      | A&D Select        |
|       | Novak MXc  | Crusher Cells     |

## 1/10-SCALE MODIFIED

| Fin | Qual | Name            | Chassis                |
|-----|------|-----------------|------------------------|
| 1   | 4    | Joel Johnson    | Trinity/CC** ReFlex 10 |
| 2   | 7    | Terry Rott      | Associated RC10L       |
| 3   | 9    | Bobby Horan     | Associated RC10L       |
| 4   | 6    | Andy Dobson     | CompCraft/TRC Lynx II  |
| 5   | 2    | Mike Blackstock | Associated RC10L       |
| 6   | 8    | Willy Decker    | Corally SP10G          |
| 7   | 5    | Tony Neisinger  | Associated RC10L       |
| 8   | 3    | Ralph Burch     | Hyperdrive             |
| 9   | 10   | Kevin Jelich    | Associated RC10L       |
| 10  | 1    | Tyree Phillips  | Associated/CC** 10L    |

| Motor       | ESC       | Batteries      |
|-------------|-----------|----------------|
| Trinity     | Novak HPC | Trinity Pushed |
| East Coast  | Novak HPC | Sonyo SCRC     |
| Reedy       | Novak M1c | Max-Cell       |
| Trinity     | Novak HPC | Trinity        |
| Reedy Mr. O | Novak M1c | Reedy          |
| Trinity     | Novak HPC | Trinity SCRC   |
| Reedy       | Novak     | Max-Cell       |
| CAM         | Tekin     | PTI            |
| Peak Perf.  | Novak HPC | Team Orion     |
| Trinity     | Novak HPI | Trinity Pushed |



# RAIN, RAIN, RAIN

**P**eople in Florida may be used to the kind of weather we experienced at the Nats, but not all the racers were. At least once a day, a thunderstorm rolled across the sky and drenched the track. During one down-pour in which the wind blew down many tents and banners, I went to my room and watched the frantic racers scramble around for their radios and gear; there seemed to be no refuge from the rain. Fortunately, this storm was brief, so the racing continued. There was, however, a delay after each storm because the track had to be vacuumed, dried and "sugared" before racing could resume. Team Class set up their chargers on a table for racers to use; it's worth noting that after rain and the abuse of being knocked over during the frenzy of the storm, they still

worked fine after they had dried.

On Sunday, the racing was supposed to have finished by about 1 p.m., but because of the storm delays, the last round of qualifying was run on Sunday. Then, racing was interrupted twice during the Mains. Three minutes into the B-Main, it rained again. The racers tried to hold out for that last minute, but within seconds, the cars began to spin out.

It looked as if we would never finish, but we did, thanks to the track crew (known as "Team Sugar")—Scott Schilke, Steve Lawson and Jim Cukla—who treated the track more

than a dozen times over the weekend. By the time we were up to the 1/10-Scale Modified A-Main, it was about 6:30. The rain in the Mains made many miss their planes!



*The wasn't the smoothest one we'd ever raced on. After it had been treated with a little sugar water, traction was easier to find.*

| Charger          | Body              | Front Tires    | Rear Tires    |
|------------------|-------------------|----------------|---------------|
| Team Class       | BBR Lotec         | PK silver      | PK gold       |
| Tekin            | BBR Lotec         | PSE red        | PSE red       |
| CE* Turbocharger | Bud's Nissan      | Jaco green     | Jaco green    |
| Turbocharger     | Associated Nissan | PSE gold       | PSE gold      |
| Tekin            | Associated Nissan | Twinn-K black  | Twinn-K black |
| Team Class       | Associated Nissan | Corally silver | Corally gold  |
| HI-10            | Associated Nissan | Arrows purple  | Arrows pink   |
| n/a              | n/a               | n/a            | n/a           |
| Tekin            | Bolink            | Bolink black   | Bolink black  |
| Tekin Reflex     | Associated Nissan | TM black       | TM black      |

**Sponsors**  
 Bruner Tuner, Team Class, Racer's Choice, Du-Mor, Corally, BBR, Scale Auto Sports, East Coast, HPI, Bullet Iron Man, Parma, PSE, Team Smooth, Boca Bearings  
 R&R Hobbies, JACO, Astro Hobbies,  
 Parma, PSE, Team Smooth, Redline Motors, Cannon Applied Science, Family Hobby Center, BCL Racing Team

Class, Du-Mor, New Wave  
 Strike Force, Max Cell, Curtis Motorsports, Bad Dog Performance, Rainbow Rider, Associated  
 n/a  
 Bolink, PTI  
 Wood Racing, TM Racing Components, Fantom Racing

| Charger          | Body              | Front Tires    | Rear Tires   |
|------------------|-------------------|----------------|--------------|
| Turbobility      | Andy's Nissan     | TRC 1          | TRC 2        |
| Novak Digi-Peak  | Associated Nissan | TRC gold       | TRC 2        |
| Novak            | Associated Nissan | TRC black      | TRC Yokomo   |
| CE* Turbocharger | Associated Nissan | TRC black      | TRC 2        |
| Team Class       | PSE Mazda         | PSE blue       | PSE red      |
| Novak            | Associated Nissan | TRC black      | TRC 1        |
| Power Push       | Bud's Nissan      | TRC            | TRC          |
| Novak            | Fast Fashion      | PSE silver     | PSE red      |
| Team Class       | Andy's Nissan     | Corally silver | Corally gold |
| Novak            | Associated Nissan | Corally silver | Corally gold |

**Sponsors**  
 Trinity, TRC, Novak, CC\*, Airtronics, CE\*  
 East Coast, Associated, Novak, TRC, Bud's, Du-Mor, Bolink, Havoline, Texaco  
 Associated, Reedy, Novak, TRC, Paragon, Bud's Airtronics, Stage III, Competition Electronics  
 CAM Supermodifieds, Team Arlington, Airtronics, Associated, Tekin, TRC, Competition Electronics, Du-Mor, HPI, Bud's, LAVco  
 PSE/Parma  
 Associated, Reedy, Novak, Airtronics, Max Cell, TRC, Autographics, Du-Mor, Starforce, Tecnacraft, Tony Neisinger Racing, Van Halen Motorsports  
 Bud's, Power Push, Novak, Associated  
 Peak Performance, Novak, Tekin, Associated, Fast Fashion Bodies, PSE, Team Orion  
 Class Recreational Products, Trinity, Du-Mor, Corally, Novak  
 Twister, Du-Mor, Novak, Team Arlington

| Charger          | Body              | Front Tires    | Rear Tires       |
|------------------|-------------------|----------------|------------------|
| Team Class       | BBR Lotec         | PK green       | Du-Mor Posi-Trak |
| Team Class       | Associated Nissan | Corally silver | Corally gold     |
| Tekin            | PSE Mazda         | PSE green      | PSE green        |
| Novak            | Bolink Porsche    | Jaco pink      | Jaco pink        |
| n/a              | Bolink            | Jaco           | Jaco             |
| Tekin Reflex     | Associated Nissan | TM green       | TM black         |
| Tekin            | Bolink Porsche    | PSE green      | PSE green        |
| Novak            | PSE Mazda         | PSE green      | PSE yellow/green |
| CE* Turbocharger | Bud's Nissan      | Jaco green     | Jaco pink        |
| Novak Digi-Peak  | Andy's Lotec      | PSE green      | PSE green        |

**Sponsors**  
 Bruner Tuner, Team Class, Racer's Choice, Tekin, Du-Mor, Corally, BBR, Scale Auto Sports, East Coast Modifieds, HPI, Bullet  
 Team Class, Du-Mor, New Wave  
 Central Florida Hobbies, Magnum Motors, PSE  
 Associated, Redline, Rainbow Riders, Team Smooth, Jaco Tires, Canon/Alderman Racing  
 Jaco, Max-Cell  
 Wood Racing, TM Racing Tires, Fantom Motors, Advantage Batteries  
 Associated, Airtronics, Team Smooth, Redline Motors, Bolink, Rainbow Rider, Parma/PSE  
 Magnum Motors, PSE, Air Art  
 R&R Hobbies, Jaco, Astro Hobbies, Dad  
 TD's Hobbies, Crusher Cells

| Charger          | Body              | Front Tires    | Rear Tires   |
|------------------|-------------------|----------------|--------------|
| CE* Turbocharger | Andy's Nissan     | TRC gold       | TRC 2        |
| Novak Digi-Peak  | Associated Nissan | TRC black      | TRC 2        |
| Novak            | PSE Mazda         | PSE silver     | PSE silver   |
| Novak            | Bolink            | TRC Yokomo     | TRC Yokomo   |
| Novak            | Associated Nissan | TRC green      | TRC green    |
| Team Class       | Andy's Nissan     | Corally silver | Corally gold |
| Novak            | Associated Nissan | TRC black      | TRC 1        |
| Tekin            | Bolink            | PSE Red        | PSE red      |
| Novak            | Associated Jaguar | PSE red        | PSE silver   |
| Novak Digi-Peak  | Andy's Nissan     | TRC gold       | TRC gold     |

**Sponsors**  
 Trinity, TRC, CC\*, CE\*, Airtronics, Novak  
 East Coast Modified, Associated, Novak, TRC, Bud's, Du-Mor, Bolink, Havoline/Texaco  
 Associated, Reedy, PSE, Max-Cell, Novak, Airtronics, Du-Mor, Bolink, HPI, Rainbow Riders, Parma, RCPS, Curtis Motorsports  
 CC\*/TRC, Trinity, Novak, Futaba, Bolink  
 Associated, Reedy, Novak, TRC, Paragon, Du-Mor, Airtronics, Bud's, Stage III, Competition Electronics  
 Trinity, Team Class, Du-Mor, Andy's, Novak, Team Class  
 Associated, Reedy, Novak, Airtronics, Max-Cell, TRC, Autographics, Du-Mor, Star Force, Tecnacraft, Neisinger Racing, Van Halen Motorsports  
 Hyperdrive, PTI, Futaba, CAM, Tekin, PSE, Pro Proven Products  
 Peak Performance, Novak, Associated, Fast Fashion Bodies, PSE, Team Orion  
 Novak, Trinity, TRC, Andy's, CC\*, Du-Mor, Benchmark Racing, Tecnacraft, Logan Engineering







# I F M A R 1/12-SCALE

by JOHN THAWLEY

**T**HE 1992 1/12-SCALE World Championships were held at the 3,000-seat Welch Arena in Grand Rapids, MI. The Rivertown Racers hosted the event, which Novak Electronics, Panasonic

and Trinity Products sponsored. Club president Ted McCarthy and vice president Al Coppock were the race directors and, with the help of more than 70 club members, they did an outstanding job.

The 135x55-foot, gray Ozite carpet track included a good combination of increasing- and decreasing-radius turns and a variety of short straights that complimented the long

back straightaway and full right-hand sweeper. This track was fast!

The atmosphere of camaraderie in the pits made hanging out there a ball, and their proximity to the track sure made my job a lot easier!

Bolink's AMB System 20 timing equipment and Don Holub's Pro Score management software handled the scoring, which was flawless. The Rivertown Racers called on Team SEM-ROCC Racing and NORCAR for back-up scoring equipment; among the three clubs, 10 sets of transponders were available.

## QUALIFYING

The most impressive stat about the qualifying rounds was the number of drivers to go 25 laps: 44. This really reflects the caliber of the competition.

In the first round, Joel Johnson and Masami Hirosaka really set themselves apart from the field. Although Johnson missed the elusive 26-lap mark by eleven hundredths of a second, Hirosaka beat the buzzer. Round two was just as thrilling. As each heat ran, the lap times fell, and four more drivers broke the 26-lap run mark: Mike Blackstock, Tony Neisinger, Kevin Jelich and Rick Hohwart.



The winning cars after three A-Main finals (left to right): Mike Blackstock's (3rd place), Tony Neisinger's (1st place) and TQ Masami Hirosaka's (2nd place). All three racers drove Associated RC12Ls.



Tony Neisinger's RC12L has Max Cell Panasonic batteries, Novak electronics and Reedy horsepower.



To capture the pole position during qualifying, Masami used this Associated 12L. A KO Propo radio, a Novak speed controller and a Reedy modified motor help the cause.

T H I R D T I M E

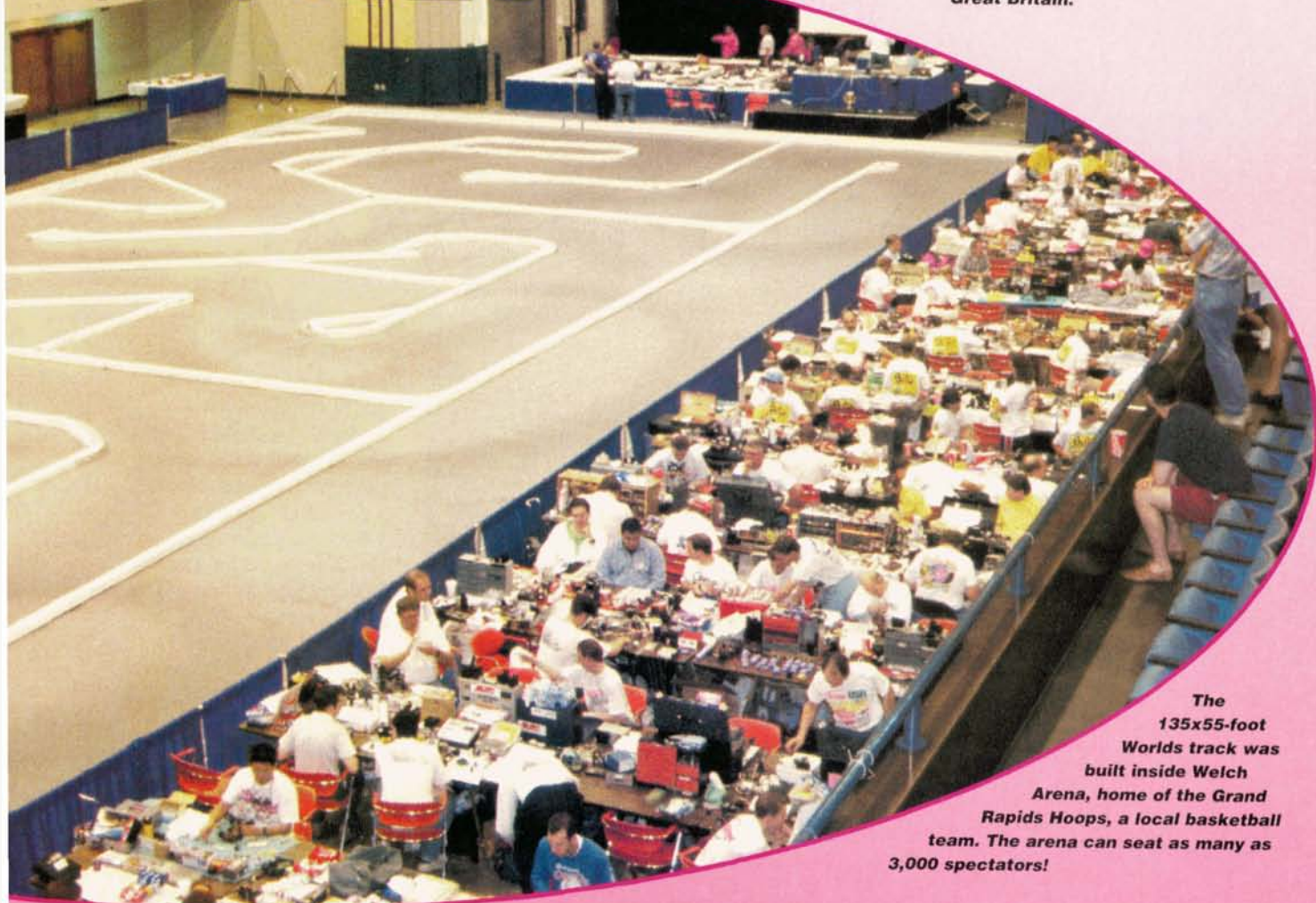


# WORLD



PHOTOS BY JIM MARCY

**Team Associated International! (Left to right) Cliff Lett, USA; Masami Hirose, Japan; and Phil Davies, Great Britain.**



**The 135x55-foot Worlds track was built inside Welch Arena, home of the Grand Rapids Hoops, a local basketball team. The arena can seat as many as 3,000 spectators!**

# CHAMPIONSHIPS

T H E C H A R I S M



# 1/12-SCALE WORLD CHAMPIONSHIPS

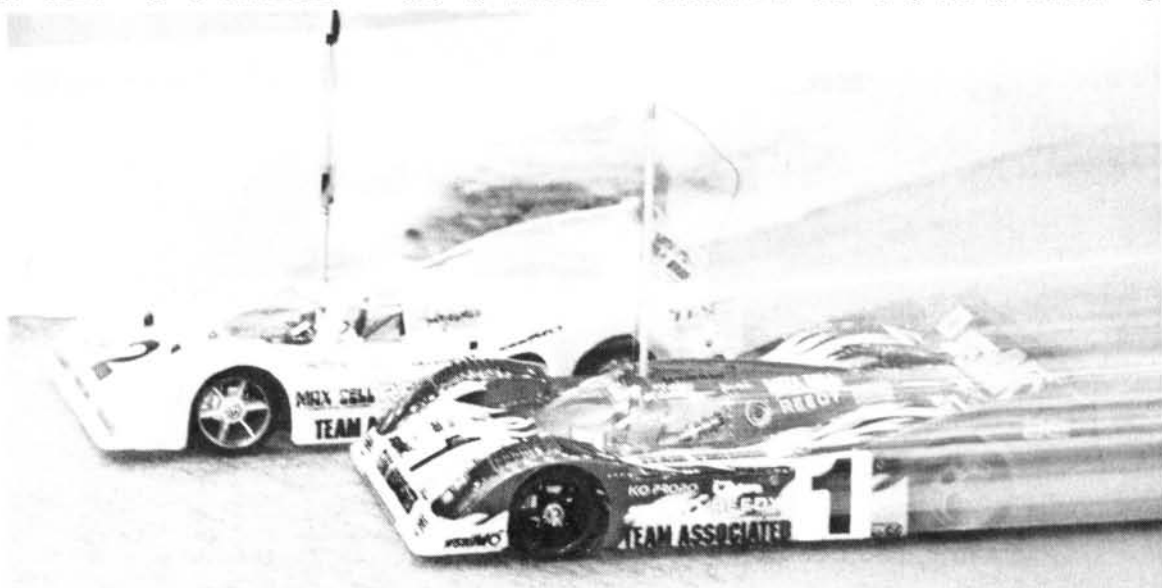
Round three was the final round of the first day of qualifying. The time spread was so small, it had *everyone* scrambling for speed. With six rounds to go, even the front-runners knew that they'd have to come up with more. Again, Hirosaka upped the TQ mark. Neisinger took over the number two spot and Blackstock was a tenth of a second behind.

Qualifying wasn't any easier on day two. The morning got underway with a round of controlled practice in which drivers had a chance to try out any changes they may have made to their cars. Although many drivers liked the improvements, they may all have been for naught, because the fast kept getting faster.

Round four was very telling. Those who had their cars sorted out began to concentrate on improving their times. Those who hadn't placed solidly had their work cut out for them. This was the first round in which Masami did *not* improve his time, but no one topped it, either. Blackstock moved into 2nd, Hohwart landed in 5th, Johnson's 26/8:18.16 put him in 8th and Rosas finished the round in 9th. All of the top 10 cars had 26 laps, and the next 56 drivers had 25-lap runs. Wow!

In round five, Johnson and Blackstock made runs at Masami's TQ position and both came up short. Blackstock improved his time but remained in 2nd, and Johnson picked up more than four seconds to move up to 3rd. The only new driver to appear in the top 10 was Martin Fliessbach.

In round six, everyone turned it up a notch. Hirosaka took advantage of his position and used this run to test the limits of his car and



**Masami Hirosaka (car one) and Tony Neisinger (car two) blast through the sweeper. They stayed this close together for the entire eight minutes of the third race!**

the track. He went out and blistered off an 18.2-second run. Johnson, not realizing what Hirosaka was up to, followed suit with an 18.60. This is *not* a sound qualifying pace! Joel recognized this as soon as he heard the time announced, and he backed away. Masami, on the other hand, took off. His second lap was a 17.96. He followed that with a 17.90, and then a frightening 17.62—the fastest lap recorded for the week. The crowd went wild. Meanwhile, Johnson established his own pace. Masami continued his “showboat” run, but dumped the car's batteries at the 6-minute mark. (It was fun while it lasted.) Other drivers of note in round six were Rosas, who moved into 3rd, and Willy Decker, who pulled up to 8th.

Like any final day of qualifying, day three was tense. With so many outstanding drivers not yet in the A-Main, the pressure was on.

Round seven set the tone. The fast, again, were getting faster. Hirosaka clicked off a 26/8:09.24, Johnson was hot on his heels and Blackstock also found a little more and went 26/8:12.74. Two newcomers to the top 10 were Ralph Burch Jr. and Oscar Jansen. Rott improved his time to maintain his spot on the bubble. Fifteen drivers had gone 26 laps.



**Left: Tekin president Kevin Orton glances up from his work. He was on hand to troubleshoot speed-controller problems for Tekin customers.**



**Right: One of the less pleasant tasks of racing—truing tires! Here, Master Masami himself gets down and dirty! No one is exempt.**

# 1/12-SCALE WORLD CHAMPS



**Good sportsmanship.** Hiro Saka congratulates Neisinger on his victory. This was Tony's third 1/12 Scale Worlds title!

**The 1/12-Scale World Championships** have always been run with six cells. Considering the popularity of 4-cell racing in the U.S., I asked several drivers which they preferred.

**RICK HOHWART:** "I feel it's relative to the size of the track. The small, four-cell tracks can be real tough."

**MIKE BLACKSTOCK:** "They're similar, but I prefer four-cell because it isn't as expensive."

**JOEL JOHNSON:** "Four-cell is better. It requires less space and the cars are more suited to it."

**MASAMI HIROSAKA:** "I feel the four-cell race is better because of the high cost of batteries and motors and also, because the high speeds require difficult car settings and maneuvering techniques."

**OSCAR JANSEN:** "Six-cell is much punchier, more difficult to drive, and the setup is harder."

**TYREE PHILLIPS:** "I prefer four-cell on a smaller track."

**ANDY DOBSON:** "With the size of most tracks, four cells is more than enough."

## Four or Six?

Except for Hohwart and Neisinger, who improved their times, there wasn't a lot of movement in round eight. Neisinger took over the number two spot and Hohwart moved up to 6th. Two more drivers joined the 26-lap club.

Round nine exploded: 8 of the top 10 drivers made the A-Main based on their runs here, and 34 drivers turned in their best runs—almost a third of the field! The prestigious 26-lap club had 22 members.

On the other hand, four drivers were knocked out of the top 10, and many others were missing in action. Defending World Champ Chris Doseck didn't make the A-Main, nor did former World Champ Kent Clausen. In fact, the final included only three of the finalists from the last Worlds, held in 1990 in Singapore.

### THE WORLD CHAMPIONSHIP FINALS

After a long week of qualifying, the day of the finals arrived. The finalists were Hiro Saka, Neisinger, Blackstock, Johnson, Jelich, David Spashett, Roasa, Cliff Lett, Steve Radecky and Hohwart. In IFMAR races, the A-Main drivers race three times. Officials then total each driver's two best races (according to the number of laps and times) to determine the finishing positions.

For the first race, Hiro Saka's car was in the pole position with Neisinger's car 2 meters behind and to the left. At the horn, Masami was out like a shot, leading the pack into the right-hand sweeper. Hiro Saka, Neisinger, Blackstock and

## NEW KO PROPO GEAR



**Chris Doseck holds the new KO Propo EX-10 transmitter—a state-of-the-art, computer-controlled FM/PCM radio that can store settings for multiple models and incorporates such features as a full range of throttle/steering trim adjustments and audible and graphic trim alarms.**



**KO Propo also unveiled two new ESCs at the '92 Worlds: the CX-II HF (left) and the CX-I. Both units have low "on" resistance, strong brakes and high-frequency operation with current limiting.**

### IFMAR 1/12-Scale Worlds

| Fin | Qual | Name             | Chassis         | Motor       | ESC            | Batteries     | Charger          | Body                | Tires (f/r)       |
|-----|------|------------------|-----------------|-------------|----------------|---------------|------------------|---------------------|-------------------|
| 1   | 2    | Tony Neisinger   | Associated 12LW | Reedy       | Novak HPc      | Max-Cell      | Novak Digi-Peak  | Associated Nissan   | Yokomo/Associated |
| 2   | 1    | Masami Hiro Saka | Associated 12LW | Reedy       | KO             | Max-Cell      | Yokomo YX-720E   | Nissan              | Yokomo/Yokomo     |
| 3   | 3    | Mike Blackstock  | Associated 12LW | Reedy       | Novak HPc      | Max-Cell      | Novak Digi-Peak  | Associated Nissan   | TRC/TRC           |
| 4   | 6    | David Spashett   | Corally SP12G   | Corally     | Corally SP12G  | PK            | Intronics        | PK Nissan           | PK/PK             |
| 5   | 5    | Joel Johnson     | Associated 12L  | Trinity     | Novak          | Trinity       | Novak Digi-Peak  | Associated Nissan   | TRC/TRC           |
| 6   | 7    | José Rosas       | Corally SP12G   | Corally     | Corally MMS II | Orion/Corally | KO               | Associated TOJ      | PK/PK             |
| 7   | 9    | Steve Radecky    | Associated 12LW | Bud's       | Novak HPc      | Power Push    | Power Push       | Bud's Nismo         | TRC/TRC           |
| 8   | 8    | Cliff Lett       | Associated 12LW | Reedy Mr. N | Novak M1c      | Reedy         | Novak Digi-Peak  | Associated Nissan   | Yokomo/Yokomo     |
| 9   | 5    | Kevin Jelich     | Associated 12LW | Peak Perf.  | Novak HPc      | Team Orion    | Novak Digi-Peak  | Fast Fashion Nissan | PSE/PSE           |
| 10  | 10   | Rick Hohwart     | Associated 12LW | Peak Perf.  | Novak HPc      | Team Orion    | Novak Digi-Peak+ | Associated Nissan   | Kawada/PSE        |



# South African Participants

**T**he best part of a Worlds event is that people come from all over the world to share this great experience. One of this year's highlights was the participation of South Africa, which has been absent from World Championship racing for 10 years. With the forming of a fourth IFMAR bloc, FEMAR, South Africa can now participate.

Frikkie Badenhorst and Gary Briant of Johannesburg represented South Africa here. Frikkie gained his qualifying spot by winning the 6-event SARDA national racing series, in which Gary took second. Drivers use their best four events for points in 1/12-scale 6-cell, 1/12-scale 4-cell and 1/10-scale stock and mod classes.

Although Frikkie and Gary are both "privateers," they had a lot of help upon their arrival, specifically

from TRC, Novak, Andy's R/C, Twister, Associated and Max Cell. Equipment in South Africa is very expensive, and they could only bring a few things with them.

When asked about the competition here, they enthusiastically answered, "Tough!" They had never raced on carpet before, and they had a lot of fun adapting to it. Although Frikkie and Gary had to settle for 6th and 7th in the K-Main, they said they wouldn't have missed it for the world. They also thought it was great to see two drivers who are very popular in South Africa—Masami Hirotsuka and Joel Johnson. They must have read about them in *Radio Control Car Action*!



South African racers Gary Briant (left) and Frikkie Badenhorst (right), pose with Gary's dad Dave for the roving Car Action cameraman.

from TRC, Novak, Andy's R/C, Twister, Associated and Max Cell. Equipment in South Africa is very expensive, and they could only bring a few things with them.

Johnson ran in that order for the first 2 minutes of the round. Hohwart worked his way up to 5th.

At the 3-minute mark, Blackstock passed Neisinger and took over 2nd. Hirotsuka maintained the lead. After fending off an attack from Hohwart, Johnson held on to 4th. The field ran in that order until the 7-minute mark, when the battle between Blackstock and Neisinger started up again. Masami, who had been in the lead from wire to wire, finished 1st, Neisinger finished 2nd, Blackstock 3rd and Hohwart 4th.

In round two, Hirotsuka entered the sweeper first, but Neisinger

came out first with Blackstock and Johnson hot on his tail, and Lett behind them. Hirotsuka had caught a board, and he emerged 5th.

By the 3 1/2-minute mark, Lett yielded to Hirotsuka, but catching the leaders would take a lot more than Hirotsuka had. He passed Johnson just after the 5-minute mark but that was as far as he got. The round finished with Neisinger in

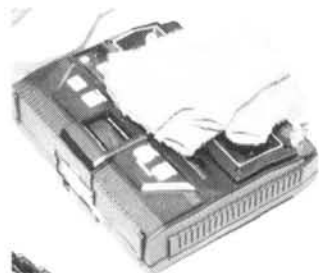
1st, Blackstock in 2nd and Masami in 3rd.

When the drivers started the final round, Hirotsuka jumped into the lead again, only this time, Neisinger was right on his tail. At the 3-minute mark, the games began, and for the next 5 minutes, the crowd was on its feet. Hirotsuka and Neisinger put on what must be the most exciting race I've ever seen. The lead changed no fewer than 12 times. They leaned on each other. They stuck right on each other's tails. They set each other up for one brilliant pass after another. This was R/C racing—in your face! Finally, Hirotsuka backed off and let Neisinger have some ground. Then, with less than two laps to go,

Masami passed Tony for the last time. Masami finished 1st, Tony 2nd and Rosas took 3rd place.

Based on his two best runs, Neisinger beat Hirotsuka by 3 seconds to win his third 1/12-Scale World Championship.

As you'd expect, the event was exciting. The competition was outstanding and the race organization was superb. I'm sure it was a pleasure for Novak, Panasonic and Trinity to sponsor and be involved in such a first-class event. Congratulations to Tony Neisinger and to the Rivertown Racers. The 1992 World Championship was a great event and a job well done!



This photo may be symbolic of Masami's defeat. I think that the only time he removed his driving gloves during the entire event was when he found out he'd lost to Tony Neisinger.

**A glimpse of the Reedy pits. What kind of goodies do we have here? Lavco's new computer dyno...an Ungar Super Race Station...and...a Trinity bearing oiler?! Ernie must've snuck it into the picture!**

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Associated, Reedy, Novak, Airtronics, Autographics, Max-Cell, Du-Mor, Starforce, Tecnacraft, Bud's, Bear Racing  
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Corally, Orion  
Bud's, Power Push, Novak, Associated, Du-Mor  
Associated, Reedy, Yokomo, Novak, Airtronics, Oakley, RCPS, Lavco, Gene's BBQ Chicken  
Peak Performance, Associated, Novak, PSE, Team Orion, Team Denied, Fast Fashion Bodies  
Peak Performance, Associated, Futaba, Novak, Team Orion, PSE, Kimbrough

**Associated's ace, Cliff Lett, gives you the hot setup for your Stealth transmission.**



## Prevent tooth decay!

**R**EBUILDING AN R/C transmission is easy, right? Then why do so many of us find it difficult? It's not rocket science, but so many factors come into play that it seems as if you need a degree to complete the task. For today's valuable lesson, we'll concentrate on Associated's\* Stealth transmission. With help from Associated's ace, Cliff Lett, we'll give you the hot tips that will help you to keep your Stealth tranny running smoothly.

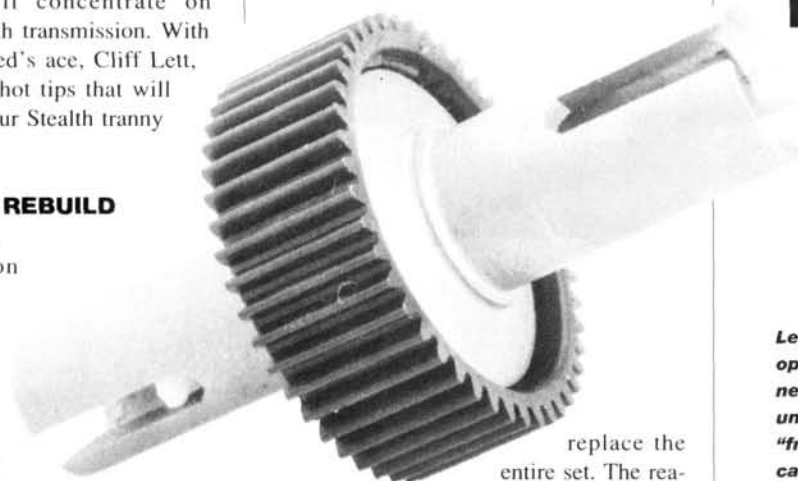
### IT'S TIME TO REBUILD WHEN...

The most common question about rebuilding transmissions is "How often?". It's a question that you'll have to answer yourself. How often and how hard do you run the car? Do you run through water or in other uncommon conditions? No matter what, the answer depends on how your tranny sounds, and, most of all, how it feels.

"The first thing I look at when I decide whether to rebuild my tranny is the diff operation," states Cliff. "If the diff feels gritty, it might need just freshening up. Disassemble the diff, and inspect the parts. If you're satisfied with their condition, regrease the diff with *Stealth Lube only*, then reassemble the diff. I can't stress enough how important it is to use our Stealth Lube on your diff. We've done extensive lubricant testing and have found that it's the only one that works properly in our transmission. If you reassemble the diff and you're still not satisfied with its performance, i.e., it still has a gritty feel, then the number-one culprit is the small

thrust washers in the thrust bearing; they're the first to go."

"After that, I'd check (in this order), the small balls, the drive rings and the larger balls. If you have to replace one ball from a set of small thrust balls, you must



replace the entire set. The reason for this is that the

balls are packaged in matched sets according to their tolerance."

"If you see actual grooves on the diff's drive rings, replace them or flip them over. If there are grooves on the small thrust washers, you can flip them over, but I don't recommend it.

Most of the time, people think there's a groove forming, but what they're really seeing is a mirrored path that the balls have polished."

# How to Rebuild a Stealth Tranny

by JOHN HOWELL

**Left: when you check diff operation, first feel for grittiness, then disassemble the unit. The diff may need only a "freshening up." If that's the case, a thorough cleaning job and an inspection for worn parts are necessary.**



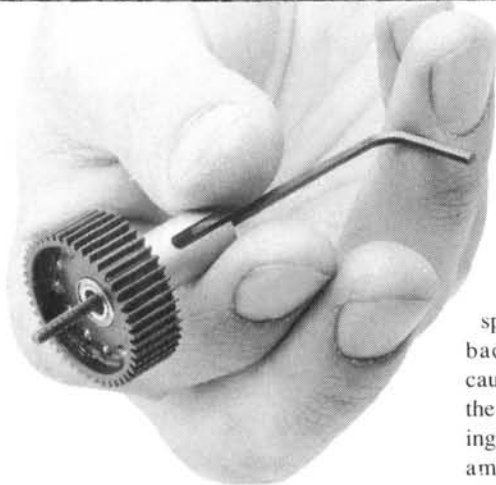
**Above: exploded view of the Stealth tranny's inner workings.**



## PICKIN' THE PINION



**Tighten the diff screw to the bottoming point, then turn it back out one-eighth of a turn. With the proper diff/slipper-clutch setup, your diff gear should last a long time.**



### WHAT ABOUT THOSE GEARS?

"Generally, your diff gear should last a long time.

Most people mess up when they set the diff. Once I tighten the diff screw to the bottoming point, I turn it back out one-

eighth of a turn. As for your other gears, check the center gear for wear and tear; it's the one under the most stress. If you race weekly, or drive under extreme conditions, I'd replace it once a month."

"When you check the idler, spur and diff gears, check on the back of the teeth for damage caused by backlash. The gears in the Stealth tranny are self-lubricating, so don't oil them. You'll contaminate your diff lube. Also, remove the bearings when you oil

ion. Below 17 teeth, the tooth form changes radically, and it doesn't mesh with the spur gear as efficiently. It's a

"Something else that people should realize is the importance of the felt gasket on the outside of the transmission. It may not seem important, but it substantially reduces the amount of dirt that enters the transmission."

So there you have it, folks—the top tips from the factory man himself. Now that you know what to look for, get working and make sure you're running smooooth!

*\*Here's the address of the company that's featured in this article: Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.*

**Check the center gear for wear and tear. It's under the most stress, and it should be replaced once a month if you race weekly or if you drive under extreme conditions.**

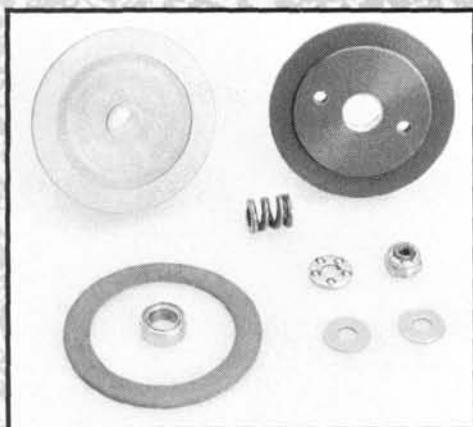
them, and dry off the excess oil before you re-install them. Any drops of oil that get into the diff lube will contaminate it, and once that happens, the diff will slip and it's history."

**The felt gasket on the outside of the tranny is essential. "It may not seem important, but it substantially reduces the amount of dirt that enters the transmission," says Cliff.**



## Slip-Slidin' Away

When you set up your slipper clutch, "set" the spring in the slipper by collapsing it with a pair of pliers 3 to 5 times. Most springs have a set point, which means that once they've been fully compressed, they won't return to their original length (they'll be slightly



shorter). If you set the spring before assembly, the spring tension will be correct the first time you adjust it.

To test the slipper, hold the car's rear tires. You should always be able to push the spur gear with your thumb without the top shaft spinning. If the top shaft spins, the diff is slipping. Go back and set

your diff so that it's one-eighth of a turn out from the bottom position. (For accuracy, use a high-quality Allen wrench.) The slipper pad is very durable. Unless it has been damaged, you won't need to replace it.

After you've set up your slipper clutch, it's track time. The ideal setting should allow the clutch to slip from 1 to 2 feet

good rule of thumb to use a spur gear that enables you to use a pinion gear that has at least 17 teeth.

## ORIGINAL VS. STEALTH: What's the diff'ence



Original RC10 transmission



New Stealth transmission

when you take off. If it slips any more than that, make sure that it's the slipper clutch, not the diff, that's slipping. Any undue stress on the diff will shorten its life (the slipper clutch is designed to lengthen it). Always keep an eye on your slipper clutch. If you make sure that it's adjusted properly, it should last a long time.

When the RC10 debuted in the early '80s, its transmission was state of the art. Today, Associated's new Stealth transmission is at the top of the heap. Here are the features that set the Stealth tranny apart from its older sibling:

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- The original diff was on the top shaft, and it had two drive trains.
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- It allows for a wider range of gear ratios.
- Its parts are made of higher-quality materials, and they're designed to much tighter tolerances.
- It has a low rotational mass.

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## LETTERS

(Continued from page 132)

Sledgehammer, so as you become more skilled, you'll be able to hop it up. Other trucks are good, but you'll have to build 'em yourself. They include Associated's RC10T, Losi's Junior T and LX-T, Schumacher's Storm, and Club 10 Storm and the top-of-the-line Traxxas Blue Eagle LS.

As for chargers, there's a vast array out there. Novak and Tekin rank among the best, and Astro Flight, Duratrax, MRC and Pro-Tech all make good entry-level chargers.

There are so many good radio systems that it's hard to tell you exactly what you want to know. I can't choose a specific radio for you, but some of the top ones are made by Airtronics, Futaba and JR. Your budget will help you choose.

As you become more skilled, you might want to upgrade, but for now, keep it simple until you have the basics. After a while, hotter motors, better speed controllers and batteries may be what you need.

Your best bet is to stick with bodies designed specifically for your R/C vehicle. Forget about mounting a 1/12-scale on-road car body on, let's say, a Clod Buster. It just doesn't look right.

JH

(Continued on page 192)

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(Continued from page 180)

## MY CAR HANDLES LIKE A BOAT

I'm 12 years old and interested in getting a Team Losi Junior Two. My dad already has two battery packs, a 540 stock motor and an ET1210 Ace R/C ESC. Since it's made for boats, do you think it would work with the Junior Two? If not, what's the most economical ESC for sport driving and possibly racing? Thank you for your time.

JEFF VAN DAM  
Des Moines, IA

*Jeff, you made me get up off my plush recliner in Car Action hi-zoot central and go over to the dank and dimly lit office of Boat Modeler to ask whether that particular speed controller would work in R/C car. It was quite a strenuous walk over there (just kidding).*

Gerry Yarrish, editor of Radio Control Boat Modeler suggests that you steer clear of using the ET1210 in a car. It's a relay-type controller, not a Mosfet type. Though its voltage ranges from 1.5 to 30 volts, its current capability is only 10 amps continuous, 30 amps intermittent. It wouldn't be able to handle the strain to which an R/C car would subject it. Check out Novak, Tekin, DuraTrax, Hitec

and Futaba for some economical speed controllers. They all produce at least one that should fit into a beginner's budget. JH

## GEAR GUESSWORK

In your "Track Reports," you sometimes say that your cars have "good power and speed," but you fail to mention what gear ratios you use in them. I (and probably other readers) would like to know what gears you use so that we'll have a starting point for our own cars. Otherwise, your magazine is perfect.

MARK WESTERFIELD  
Oceanside, CA

*Mark, we don't include gear selections because everyone runs in a different situation. For example, let's say we tested an RC10T on a tight, twisting track with few, if any, straight-aways (low gearing). We then describe the gearing we used, and readers select it for their cars. What about those who race on tracks where there are a lot of straights and top speed is a major concern? They're bummed, because they're geared way too low for that situation. We're currently concentrating on putting together a basic article on gearing, so*

*if you're in the dark when it comes to that topic, stay tuned. We'll be shedding some light on it.* JH

## ELECTRIC EGYPTIAN

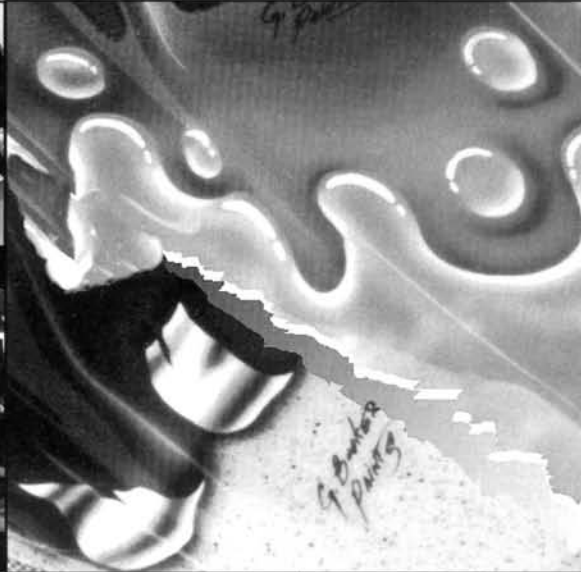
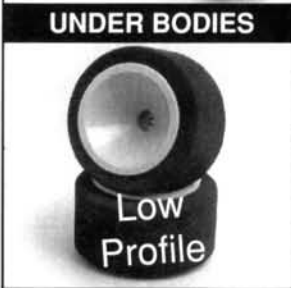
While realigning my steering servo, I brainlessly connected my battery to the motor plug instead of to the battery plug. I have a Tekin 411P ESC, so the fuse got thoroughly fried, and I have yet to find out whether the ESC has been damaged. Anyway, let me get to the point. I've looked all through many issues of your excellent magazine for suggestions as to what I should use as a replacement fuse. Because I live in Egypt, where we only dream of a local hobby shop, that option is out. I was thinking about going Novak style and sticking a drop of solder in there, but first, I'd like to hear some other (less dangerous) suggestions.

ROBERT JORDAN

USAID/Cairo Unit

*I talked to Tekin's owner, Kevin Orton, and he said that you can buy a fuse directly from Tekin and that you should also be able to buy one where you bought the speed controller.*

(Continued on page 207)

|                                                                                                                                                                       |                                                                                                                             |                                                                                      |                                                                                                                         |                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------|
|  <p><b>LETHAL WEAPON</b><br/><b>Power Clutch</b><br/>6 Models with Power Clutch</p> |  <p><b>TRX1-BE/LS</b></p>                |  |  <p><b>TRX1</b></p>                |                             |
|  <p><b>UNDER BODIES</b></p>                                                         |  <p><b>TAMIYA KING CAB</b></p>           |                                                                                      |  <p><b>Interceptor #9506</b></p>   |                             |
|  <p><b>Low Profile</b></p>                                                          |  <p><b>TRX-1 &amp; Blue Eagle LS</b></p> |                                                                                      |  <p><b>Slam-it-Lower #9501</b></p> |                             |
| <p><b>TRUCK FOAMS</b></p>                                                                                                                                             | <p><b>TRAXXAS DOG BONES</b></p>                                                                                             | <p><b>TRUCK SPOILER</b></p>                                                          | <p><b>SE CONCEPT #9507</b></p>                                                                                          | <p><b>STEERING KITS</b></p> |

For Catalog: U.S.—\$2.00, Canada—\$2.50 and Overseas—\$3.50 U.S. Funds only. Decal sheets are available in fluorescent pink, yellow or blue—\$1.25 ea. T-Shirts are available in two colorful styles of S, M, L, XL & XXL, #1 is A&L Rear End—\$10.65 ea., #2 is Power Clutch/Lethal Weapon—\$11.95 ea. Please add shipping of \$3.50 for 1–3 shirts. CA residents add 7.75% sales tax. Mail to A&L Manufacturing, P.O. Box 2115, Corona, CA 91718



# WHAT'S NEW



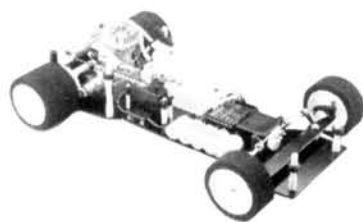
## **CUSTOM WORKS Qualifier Tire**

Qualifier tires work well and look good. These replica sprint-car tires are standard equipment on the Enforcer kit. They offer excellent traction on semi-loose dirt tracks and are available for front and rear applications.

Part nos. 6201 (front); 6211 (rear).

Prices: \$11; \$12.

Custom Works, 3720 Easton Dr. #7, Bakersfield, CA 93309; (805) 323-0471.



## **DURATRAX GT-10**

DuraTrax blasts into car design with the innovative, 1/10-scale GT-10, which includes a powerful O.S. .12 CZ-R engine with easy recoil starting. The large capacity fuel tank extends run times by as much as 20 minutes and has a flip-top cap for quick refueling. Also standard are the DuraTrax high-performance CZ-R Slide Valve Carburetor, an 1/8-inch fiberglass flat-pan chassis, heavy-duty brakes and rear ball bearings. The GT-10 is also available without an engine.

Part no. DTXC0800

Great Planes Model Distributors, 1608 Interstate Dr., Champaign, IL 61821; (217) 398-3630.



## **BOLINK GMC Sycamore Body**

The 1/10-scale truck body is based on the newest pickup: the GMC Sycamore. The body boasts aerodynamic styling and wind-tunnel testing. A matching Sycamore decal sheet is offered to complete the package.

Part nos. BL-2313 (pickup body); BL-2653 (decal sheet).

Prices: \$18.95; \$4.95.

Bolink, 420 Hosea Rd., Lawrenceville, GA 30245; (404) 963-0252.



## **SEGA GAME GEAR R/C Grand Prix**

Complete with killer graphics and stereo sound, the portable R/C Grand Prix delivers 10 thrilling levels of R/C car racing for up to four players, anytime, anywhere. One player at a time competes against three computer opponents. The 10 courses get progressively harder and more tricky as the racers zoom through dangerous track crossovers, hairpin curves and other high-speed challenges.

Price: \$30

Absolute Entertainment, 251 Rock Rd., Glen Rock, NJ 07452; (201) 652-1227.



## **DAHM'S The Razer Body**

The Razer fits the Kyosho body (shown) and features low aerodynamic styling, highly effective motor-cooling vents and fine detailing. It also fits the Yokomo YZ-10 and the Kyosho Raider Pro. The Razer is made of an .03-inch-thick GE Lexan for lightness and strength. Mounting instructions with photos are included.

Price: \$14.98

Dahm's, P.O. Box 360, Cotati, CA 94931-0360; (707) 792-1316.



## **INSIDE LINE Split-Beam Front End**

This high-performance, aluminum, split-beam front end was designed for maximum performance and easy maintenance in the pits. Light and dependable, it's hand-crafted and has fully adjustable camber, caster and width. The standard kit includes four half-axes—0, 1, 2 and 3 degrees—or any other combination specified when ordering.

Price: \$65.95

Inside Line, 12859 Route 108, Highland, NJ 20777; (301) 854-2701.



### TEAM LOSI Full Radius Monster Truck Tire

Team Losi announces an addition to its "Naturals" tire line. The Full Radius ribbed front tires offer improved steering for the new breed of racing trucks. Like all Naturals truck tires, the reinforced "carcass" design and extra-wide bead allow better and more consistent performance.

Part no. TLA-7231

Team Losi, 13848 Magnolia Ave., Chino, CA 91710; (714) 465-9400.



### PRODEUS RACING PRODUCTS Body Grommets

Prodeus rubber grommets are the solution to body splitting and cracking problems around the body posts. Drill body mounting holes as usual, then slip in flexible rubber grommets to strengthen the body and protect it from being damaged. Available in two sizes, for off-road and on-road use, body grommets are inexpensive insurance for your expensive Lexan body.

Part no. 601

Price: \$2.95 /pack of 5

Prodeus Racing Products, 2069 Temple Tr., Jamul, CA 91935; (619) 468-9348.



### TRAXXAS Rad 2

Last year's Radicator has been updated. The new Rad 2 sets a high performance standard for inexpensive cars. Its features include a quiet, efficient planetary-gear-diff transmission, a slipper clutch, new fully independent suspension with long rear arms, four long shocks and 2.15-inch racing wheels. The Rad 2 is available in an unassembled kit form with a 540 motor and a mechanical speed controller, or ready to run with an electronic speed controller and radio installed.

Part nos. 2306 (assembled); 2301 (unassembled).

Traxxas, 12150 Shiloh Rd., Dallas, TX 75228; (214) 613-3300.



### RAETECH Hex and Ball Drivers

RaeTech offers hex drivers and ball drivers with replaceable tips. The straight hex drivers come in these sizes: .050, 1/16, 5/64, 7/64 and 3/32 inch, 1.5mm, 2mm, 2.5mm and 3mm. The ball drivers come in these sizes: 5/64, 7/64 and 3/32 inch, 2mm, 2.5mm, and 3mm. All tips are made of high-speed steel and are ground to size for a perfect fit.

Prices: \$9—hex drivers (\$4.30—replacements tips); \$11—ball drivers (\$6.70—replacement tips).

RaeTech Inc., 3101 West Thomas Rd., Phoenix, AZ 85017; (602) 272-4223.



### TRINITY Cleaning Spray

Trinity's Motor Doctor "ozone-safe" cleaning spray comes in a small 16-ounce can size so it easily fits in a pit box.

Part no. 4023

Price: \$5.99

Trinity Products Inc., 1901 E. Linden Ave., Linden, NJ 07036; (908) 862-1705.



### A&L

### Low-Profile Foam Truck Tires

A&L's monster truck wheels in four neon colors and white are now available with pre-mounted low-profile foam tires. The approximate trued size of the tire is 3 3/16 inches (outside diameter) by 1 9/16 inches (width). The foam compounds come in green, blue (for asphalt) and M/2 (for clay oval). The rims' strong outer bead protects the foam from cuts, nicks and damage. Available for front 5x11mm wheel bearing rims, Team Losi's JR-XT (front and rear), Kyosho's trucks, Associated's RC10T and Traxxas' trucks.

Price: \$19.95/pair

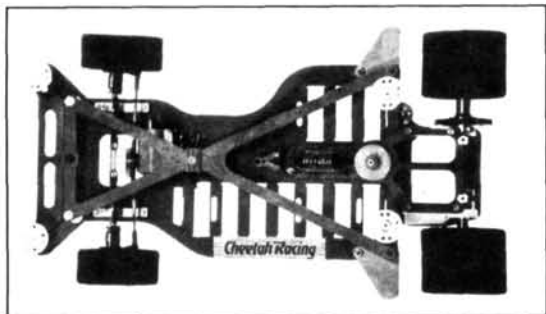
A&L Mfg., P.O. Box 2115, Corona, CA 91718; (714) 735-5249.

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here doesn't constitute endorsement by **Radio Control Car Action**, nor guarantee product performance or safety. When writing to the manufacturer about any product described here, be sure to say you read about it in **Radio Control Car Action**.



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6. All parts are available separately or together making this the most complete and advanced conversion available.

Chassis . . . . Part #PS52 Cross Brace & Hardware . . . #PS54

## LETTERS

(Continued from page 192)

You could solder the two fuse pins together, but be careful that you don't drip any solder inside the controller, or you may short something out. If you take that route and you pop the soldered fuse again, the solder may drip down and damage the electronics.

Tekin is now converting to the more convenient solder-pop-type fuse. Contact Tekin Electronics, 970 Calle Negocio, San Clemente, CA 92672.

JH

## I'VE GOT GAS

After nearly two years without R/C racing—or even being involved in R/C cars—I decided to get back into it again. All of my equipment was gone when I picked up your September '92

issue to price some trucks, so after I read about the Southeast Gas Off-Road Championships, I decided to go to nitro-powered trucks. I figured for the price of an RC10T, Storm, or LX-T, plus a peak-charger and other stuff I'd need to race, I could get a gas truck. So sight unseen, I ordered a Schumacher Nitro 10 MK II truck.

Talk about intense performance out of the box! I was blown away by its speed, power and handling. I'm very pleased with my new purchase, and I have your magazine to thank for it.

If any readers are fed up with the constantly changing, expensive technology of electric cars and trucks, give one of these nitro-powered machines a try—I'm glad I did.

JAMES HUDDLESTON

Bohemia, NY

We feel the same way about nitro-powered

R/Cs that you do, James, but we'll never quite give up on our electrics, either. You're right, though, the power and speed of gas trucks and buggies is definitely a thrill. We hope that more and more people like you will be turned on to this form of R/Cing.

JH

## CONFUCIUS SAYS

Just when I thought I had it all straight...

I thought I understood the lingo. Wrong! I was looking at an ad in your magazine that listed a slew of motors, and most of them had descriptions that included single, double, triple, etc. What is it? What does it all mean? How will it affect my life? WILL IT BE ON THE TEST???

It would benefit the public if you'd write an article that defined all these motor terms and

(Continued on page 214)

Hohwart • Masami Hirotsuka • Cliff Lett • Chris Doseck • Joel "Magic" Johnson • Jammin' Jay Halsey • Gil Losi • Tyree Phillips

**Autographed Driver Cards randomly inserted**

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## LETTERS

*(Continued from page 207)*

provided a simple formula for picking the right motor for your car. With this formula, we could ignore all those confusing statistics from the motor companies, world peace would break out and there wouldn't be any more letters asking you if an 8-turn Napalm Vampire 1000 would be powerful enough for a Grasshopper.

B.D. PHILLIPS  
Concord, NH

*B.D., B.D.—you poor soul. You should know that no one in the R/C world ever “has it all straight.” Here’s this week’s version: single means that you aren’t attached, aren’t living with someone, or aren’t made up of more than one cell (you’re essentially a blob of protoplasm); double means that she lets you hold*

*her hand, but you can’t play “tonsil hockey”; triple means that you live too close to a nuclear power plant and have grown one (or two) too many appendages. Got it?!*

*Seriously, you can’t expect me to go through the entire dictionary definition of electric motor terms right here and now, can you? You do? Look, buddy, I’ve got a wife and kids at home who also need my time, you know...all right, I’m not married and I don’t have kids...but there’s a new “Ren and Stimpy” on tonight, and I don’t want to miss it...so save me some time and check out the answer to the letter titled “Becoming Unwound” in my “Troubleshooting” column in the October ‘92 issue. If you can’t find it, subscribe! FM*

## CHRISTMAS WISH LIST

*continued from page 29*

### SANTA'S ELVES

**Spy Cam**—Supercircuits, 13015 Debarr Dr., Austin, TX 78729.

**Dudgeon Racing Gas RC10T**—R/C Motorsports, 3731 W. 95th, Overland Park, KS 66206.

**Evolution 10**—Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036.

**Robot**—Tomy America Inc., 1050 W. Central Ave., Brea, CA 92621.

**Pit Gear**—Yonezawa; distributed by Impulse Inc., 8416 Xerxes Ave. N, Brookland Park, MN 55444.

**Chris's hair**—contact Don King.

**Cliff Lett Driving Seminar**—Cliff won't tell us where he lives.

**Ferrari 643**—Great Planes Model Distributors Co., P.O. Box 9021, Champaign, IL 61826.

**JR R-756 Transmitter**—Hobby Dynamics Distributors, 4105 Fieldstone Rd., Champaign, IL 61821.

**HPI 10L Accessories**—Hobby Products Int'l, 22600 C-Lambert St., Ste. 904, El Toro, CA 92630.

**BMT 891**—Racer's Choice, 6N258 Acacia Ln., Medinah, IL 60127.

**Radio Control Car Action**—subscription hotline: (800) 877-5169.

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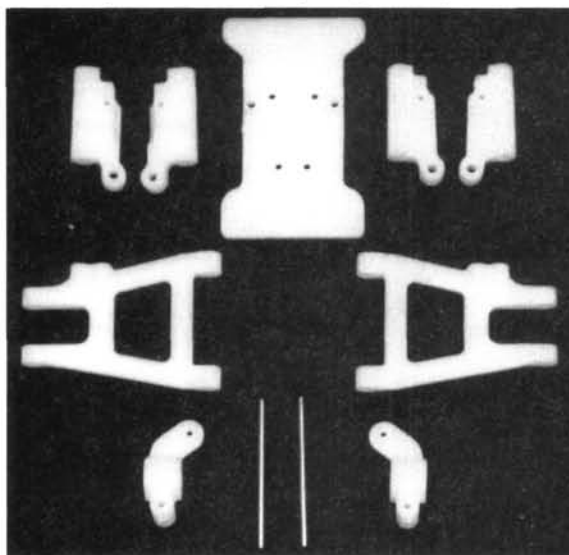
# RPM

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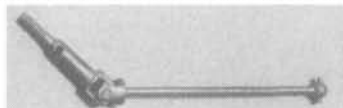
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| R.C.C.A. Action Series Subscription     | 83                             |
| R.C.C.A. Buyers' Mart                   | 171-177                        |
| R.C.C.A. Customer Service               | 8                              |
| R.C.C.A. Subscription                   | 67                             |
| R/C International                       | 156-157                        |
| R/C Motor Sports of Miami               | 94                             |
| RC Performance Specialties              | 132                            |
| Retailer                                | 169                            |
| Rivergate Hobby Center Inc.             | 112                            |
| Robinson Racing                         | 107                            |
| Rocket City R/C Specialties             | 94                             |
| RPM                                     | 218                            |
| S&K Racing Products                     | 57,199                         |
| S+S Racing Products                     | 66                             |
| Saiko Racing Products                   | 180                            |
| Sanyo Energy Corp.                      | 42                             |
| Sassy Chassis                           | 158                            |
| Schumacher Inc.                         | 69,193                         |
| SCI Power Corporation                   | 78                             |
| Sheldon's Hobbies                       | 150-153                        |
| Sherline Products                       | 191                            |
| Sig Manufacturing                       | 25                             |
| Southside Hobbys                        | 195                            |
| Speedworks Grand Finale                 | 154                            |
| Stage III                               | 86                             |
| Stealth Electronics                     | 72                             |
| Stormer Hobbies                         | 208-213                        |
| Tammie's Hobbies                        | 217                            |
| TD Enterprises                          | 100                            |
| Team Losi                               | 21,87,161                      |
| Team Losi Tech Talk                     | 86                             |
| TEKIN                                   | 50,109                         |
| The Finest R/C                          | 162-166                        |
| The Inside Line                         | 82                             |
| Thorp Manufacturing, Inc.               | 10,108                         |
| Tomy America Inc.                       | 95                             |
| Top Gun R/C Products                    | 108                            |
| Top Racing Products                     | 32                             |
| Tower Hobbies                           | 181-190                        |
| Track Directory Coupon                  | 132                            |
| Traxxas                                 | 60,146,194,201                 |
| TRC                                     | 30                             |
| Trinity Products                        | 3,18-19,39,75,110-111,131      |
| Twister Motors                          | 142                            |
| Ultimate Hobby Corp.                    | 178                            |
| Victor Engineering                      | 160                            |
| Vortex Distributing                     | 38                             |
| Walt's Hobby                            | 100                            |
| WCM                                     | 82                             |
| World Class Inc.                        | 82                             |